

HYDRAULIC CONTROL SYSTEM

ELECTRO-HYDRAULIC SERVO VALVE



Twin flapper-nozzle electro-hydraulic servo valve

RT6215M

Size: 10

Maximum pressure: 31.5 MPa

Rated flow: 5-75 L/min (△ P_N=7 MPa)

Features and Benefits

- Suitable for closed-loop control of position, force and speed
- Frictionless double nozzle-baffle control stage
- High dynamic response
- High resolution, low hysteresis
- Dry torque motor and two stages of hydraulic power amplification.
- High driving force of spool
- Strong anti-fouling capability
- Plate connection structure
- Can be used as a 3-way valve
- High reliability and long service life.

The output flow rate of the valve is related to the input command electrical signal and the pressure drop at the throttle of the valve. For a given valve pressure drop, the output flow rate of the valve can be calculated by the following equation

$$Q = Q_N \sqrt{\frac{\Delta P}{\Delta P_N}}$$

Q— Actual flow，L/min

Q_N — Rated flow，L/min

Δp — the actual pressure drop of the valve, MPa

$\triangle P_N$ — the rated pressure drop of the valve, MPa

Working Principle

RT6215M is a standard performance two-stage electro-hydraulic servo valve, mainly used for position, force and speed closed loop control

Structure:

The valve consists of the following parts

-Pilot stage:

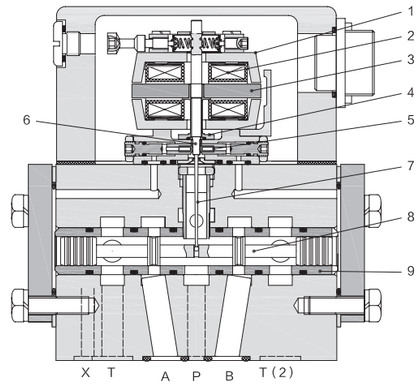
An electro-mechanical converter (torque motor) (1)

One hydraulic amplifier (consisting of nozzle (5), baffle (6))

-Power level:

spool (8), valve sleeve (9) and other components

-The spool is connected to the torque motor through mechanical feedback



Working Principle:

In the torque motor coil (2) input an electrical signal, will produce electromagnetic force on the armature (3) ends to form an electromagnetic torque, then the armature deflection drive pipe spring (4) and baffle (6) deflection, baffle deviation from the middle will reduce the flow of a nozzle (5), and then change the pressure of the nozzle and the spool (8) side, resulting in pressure difference to push the spool to move towards the - side. The displacement of the spool opens the oil circuit between the oil supply port (P port) and a control port (A or B). At the same time, the displacement of the spool generates a force through the feedback lever (7) connected with the baffle, forming a return torque to the armature. When the return torque is balanced with the electromagnetic torque, the baffle returns to the neutral position, and the pressure on both sides of the spool is equal. The spool displacement is proportional to the size of the input electrical signal, and the load flow rate is proportional to the spool displacement at a constant pressure drop.

RADK-TECH

Order Model Description

RT 62 1 5 M - XXX H 60 S M 4 N 2 B 4 B P

RT	Shanghai Radk-Tech Hydraulic system co., ltd.

Servo Valve Model	
62	High power nozzle baffle secondary valve

Mounting surface standard	
1	Mounting dimensions in accordance with ISO 4401

Latus rectum	
5	Latus rectum is 10mm

Feedback Type	
M	Mechanicl feedbacks

Design code	
	Design Serial Number

Pressure Series	
H	210bar
K	315bar
T	Special, according to customer needs

Flow(at △p=7Mpa)	
5	5L/min
10	10L/min
20	20L/min
40	40L/min
60	60L/min
75	75L/min

Command signal	
P	+/-50mA(Tandem)

Sockets Direction	
A	Towards A
B	Towards B

Electrical sockets	
4	Four-prong socket

Coil connection method					
B	Parallel	C	Series	D	Single coil

Nominal resistance of coils	
2	28Ω

O-ring material	
N	Buna-N
V	Fluoroelastomer

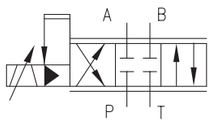
Pilot stage control form	
4	Internal control internal exclusion
5	External control internal row

Power stage spool position in case of no signal or no oil supply	
M	Median

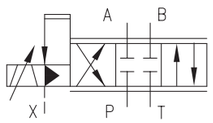
Main valve spool function	
S	Standard
P	Positive covering
N	Negative covering
T	Special,customized to customer requirements

Functional Symbols

RT6215M···M4···



RT6215M···M5···

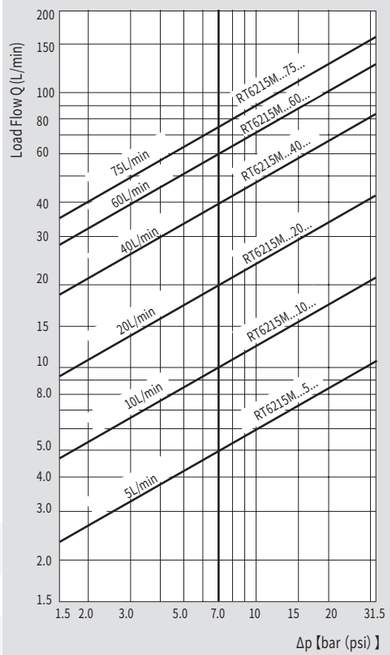


Technical parameters

General Technical Data	
Operating pressure	port P、X、A、B: ⩽ 315 bar
	port T: ⩽ 140 bar
Temperature range	Storage temperature range: -20 to +80°C
	Ambient temperature range: -20 to +60°C
Seal material	NBR、FPM（other upon request）
Working medium	Mineral oil (HL, HLP) according to DIN 51 524, please consult for other hydraulic fluids
Fluid viscosity	15-100mm²/s (priority 30-46 mm²/s) Note: at 38°C
System filtration	High pressure filter without bypass and with alarm device shall be installed in the main oil circuit of the system. If possible, install the oil filter directly at the oil supply port of the servo valve
Recommended Fluid Cleanliness Grade	Regular use:ISO 4406:1999＜19/16/13 Long-life use:ISO 4406:1999/17/14/13
Filtration accuracy (Recommended Values)	Regular use:β_{15} ⩾75, Long-life use:β_{10} ⩾75
Installation requirement	Any position, fixed or moveable. Ensure that the pilot control system has sufficient pressure when the system is started(⩽10bar)
Vibration resistance	30g, 3 axis
Weight	2.3kg （Including protection board）
Degree of protection	EN6025: Class IP 65, with mating connector mounted
Protective base plate	With protective base plate

Static and dynamic data	
Model type	RT6215M-...
Mounting pattern	ISO4401-05-05-0-94
Valve body structure	Four-way two-stage servo valve with spool and sleeve
Pilot stage	Nozzle Flapper
Pilot stage control	Internal or external control
Oil supply pressure	Minimum 14 bar, Maximum 315 bar
Proof pressure	Port P: 465 bar, Port T: 210 bar
Rated flow	5,10,20,40,60,75 (at±10%L/min, ΔP_N=70 bar)
Resolution ratio	<1%(P_p=140 bar)
Hysteresis	<4%(Δp=70 bar)
Null shift	<4% (at ΔT=38℃) <3% (At 80-110% P_p change in supply pressure)
Maximum internal leakage	<3L/min(P_p=140 bar)
Zero Offset	＜2%
Freq. response	=-90°Phases＞50HZ (at P_p=210bar)

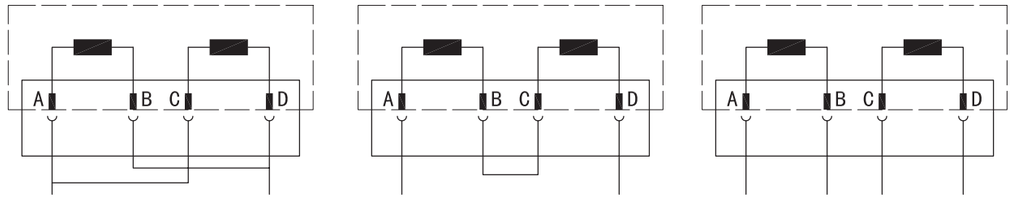
Load Flow Diagram



Load flow rate of the valve versus valve pressure drop when the valve port is fully open (100% of the given input signal)

Electrical connection Electrical connection

The electrical connection can be in series or parallel, for safety and low coil inductance, parallel connection is recommended



Parallel connection　　Series connection　　Single connection

The RT6215M is available in two models with rated current and coil resistance，See the table below

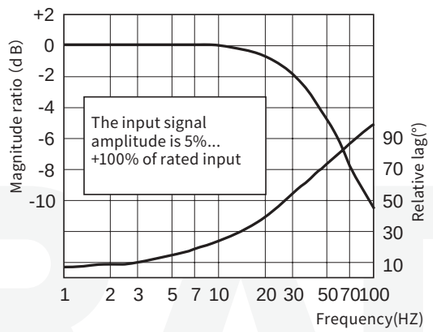
Wiring method	Parallel		Serial		Single	
Designator	R	Q	R	Q	R	Q
Nominal resistance value of single coil (Ω)	28	300	28	300	28	300
Coil resistance(Ω)	14	150	56	600	28	300
Rated current (mA)	±100	±30	±50	±15	±100	±30
Coil inductance (at 60HZ)(H)	0.2	1.8	0.8	7	0.25	2
Electrical power(W)	0.14	0.14	0.14	0.14	0.28	0.27
Input polarity when the valve is P→B A→T	A and C(+) B and D(-)		A(+),D(-) B,C short connection		A(+) ，B (-) or C (+) ，D (-)	

Coil Connection: The servo valve has a 4-prong electrical socket (matching the MS3106F14S-2S cable plug), and the 4 leads of the torque motor are all at the sowing base, so the torque motor coil can be connected in series, parallel or differential connection, when the coil is connected in series, the rated current is half of the parallel connection.

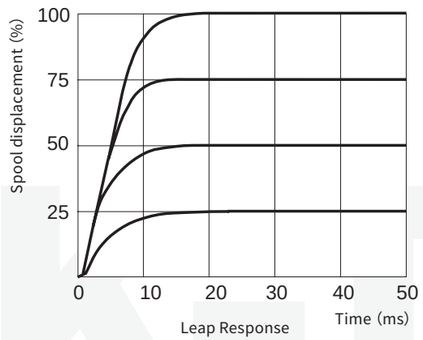
Servo Amplifier: Since the servo valve input is a current signal, a high internal resistance amplifier (with negative current feedback) must be used so that the effect of coil inductance and coil resistance changes on the current can be minimized.

Note: The pilot stage must establish the oil pressure before the electrical signal is input

Characteristic Curve (Measured at v=32 mm/s, θ=40 °C, pilot control pressure of 21 MPa)

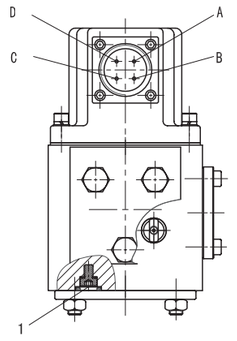


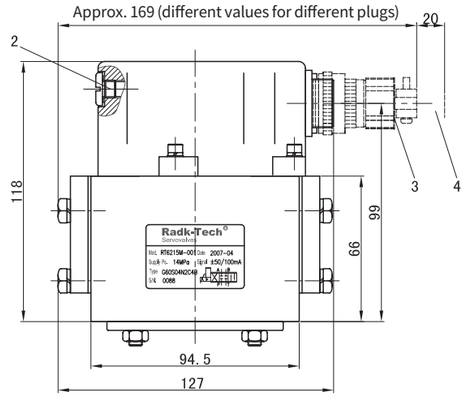
Response frequency

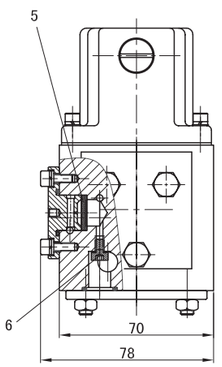


Leap Response

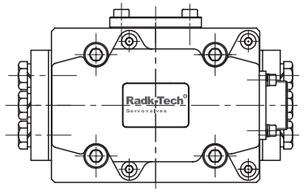
Dimensions and pilot control







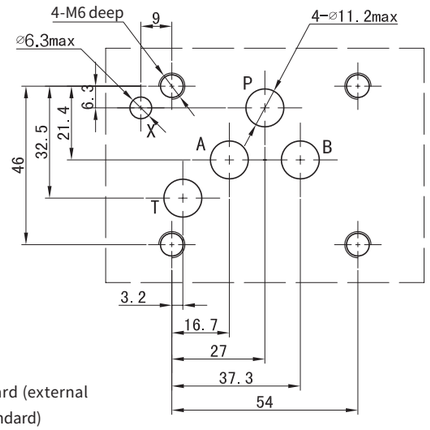
1) x-port screw plug
2) Zero port (The zero offset of the valve is adjusted at the adjustable zero port, please consult when adjusting.)
3) 4 plugs (MS3106F14S-2S or other plugs of the same type, to be ordered separately)
4) Space for disassembling the plug
5) Folding filter
6) P-port screw plug



Pilot control

	X-port screw plug(1)	P-port screw plug(6)
Internal Control	Install	Disassemble
External Control	Disassemble	Install

Mounting dimention



Comply with IS04401-05-05-0-94 standard (external control port X does not conform to this standard)
Mounting screws: 4-M6X70 -10.9 (GB/T70.12000)
M_A=13N.m, to be ordered separately



Mounting surface machining accuracy

RADK-TECH



Twin flapper-nozzle electro-hydraulic servo valve

RT6225M

Size: 10

Maximum pressure: 21 MPa

Rated flow: 40 L/min (△ P_N=7 MPa)

Features and Benefits

- Suitable for closed-loop control of position, force and speed
- Frictionless double nozzle-baffle control stage
- High dynamic response
- High resolution, low hysteresis
- Dry torque motor and two stages of hydraulic power amplification.
- High driving force of spool
- Strong anti-fouling capability
- Plate connection structure
- Can be used as a 3-way valve
- High reliability and long service life

The output flow rate of the valve is related to the input command electrical signal and the pressure drop at the throttle of the valve. For a given valve pressure drop, the output flow rate of the valve can be calculated by the following equation

$$Q = Q_N \sqrt{\frac{\Delta P}{\Delta P_N}}$$

Q— Actual flow，L/min

Q_N— Rated flow，L/min

Δp — the actual pressure drop of the valve, MPa

$\triangle P_N$ — the rated pressure drop of the valve, MPa

Working Principle

RT6225M is a two-stage electro-hydraulic servo valve, mainly used for position, force and speed closed-loop control

Structure:

The valve consists of the following parts

-Pilot stage:

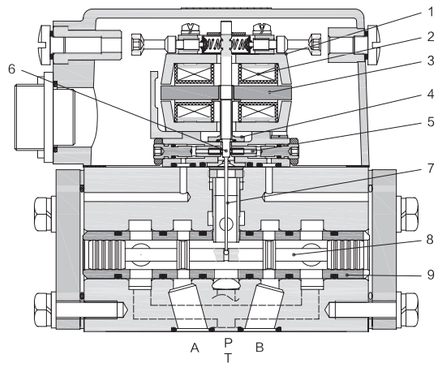
An electro-mechanical converter (torque motor)（1）

One hydraulic amplifier (consisting of nozzle (5), baffle (6))

-Power level:

spool (3), valve sleeve (2) and other components

-The spool is connected to the torque motor through mechanical feedback



Working Principle:

In the torque motor coil (2) input an electrical signal, will produce electromagnetic force on the armature (3) ends to form an electromagnetic torque, then the armature deflection drive pipe spring (4) and baffle (6) deflection, baffle deviation from the middle will reduce the flow of a nozzle (5), and then change the pressure of the nozzle and the spool (8) side, resulting in pressure difference to push the spool to move towards the - side. The displacement of the spool opens the oil circuit between the oil supply port (P port) and a control port (A or B). At the same time, the displacement of the spool generates a force through the feedback lever (7) connected with the baffle, forming a return torque to the armature. When the return torque is balanced with the electromagnetic torque, the baffle returns to the neutral position, and the pressure on both sides of the spool is equal. The spool displacement is proportional to the size of the input electrical signal, and the load flow rate is proportional to the spool displacement at a constant pressure drop.

Order Model Description

RT 62 2 5 M - XXX

H 40 S M 4 N 2 B 4 B P

RT	Shanghai Radk-Tech Hydraulic system co., ltd.

Servo Valve Model	
62	High power nozzle baffle secondary valve

Mounting surface standard	
2	Mounting dimensions in accordance with ISO 10372

Latus rectum	
5	Latus rectum is 10mm

Feedback Type	
M	Mechanicl feedbacks

Design code	
	Design Serial Number

Pressure Series	
G	15MPa
H	21MPa

Flow(at △PN=7Mpa)	
40	40L/min

Main valve spool function	
S	Standard
P	Positive covering
N	Negative covering
T	Special,customized to customer requirements

Power stage spool position in case of no signal or no oil supply	
M	Median

Pilot stage control form	
4	Internal control internal exclusion

O-ring material			
N	Buna-N		
V	Fluoroelastomer		

Nominal resistance of coils	
6	300Ω

Coil connection method					
B	Parallel	C	Series	D	Single coil

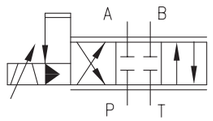
Electrical sockets	
4	Four-prong socket

Sockets Direction	
A	Towards A
B	Towards B

Command signal	
P	+/-50mA(Tandem)

Functional Symbols

RT6225M...M4...



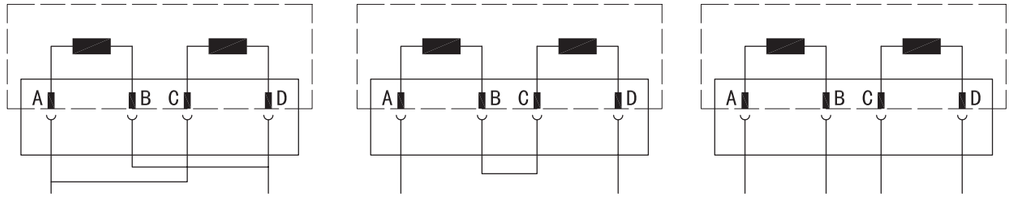
RADK-TECH

Technical parameters

General Technical Data	
Operating pressure	port P、X、A、B: ⩽ 210 bar
	port T: ⩽ 100 bar
Temperature range	Storage temperature range: -20 to +80°C
	Ambient temperature range: -20 to +60°C
Seal material	NBR、FPM（other upon request）
Working medium	Mineral oil (HL, HLP) according to DIN 51 524, please consult for other hydraulic fluids
Fluid viscosity	15-100mm^2/s (priority 30-46 mm^2/s) Note: at 38°C
System filtration	High pressure filter without bypass and with alarm device shall be installed in the main oil circuit of the system. If possible, install the oil filter directly at the oil supply port of the servo valve
Recommended Fluid Cleanliness Grade	Regular use:ISO 4406:1999＜19/16/13 Long-life use:ISO 4406:1999/17/14/13
Filtration accuracy (Recommended Values)	Regular use:β_{15} ⩾75，Long-life use:β_{10} ⩾75
Installation requirement	Any position, fixed or moveable. Ensure that the pilot control system has sufficient pressure when the system is started(⩽10bar)
Vibration resistance	30g, 3 axis
Weight	1.9kg （Including protection board）
Degree of protection	EN6025: Class IP 65, with mating connector mounted
Protective base plate	With protective base plate
Static and dynamic data	
Model type	RT6225M-⋯
Mounting pattern	ISO10372-04-04-0-92
Valve body structure	Four-way two-stage servo valve with spool and sleeve
Pilot stage	Nozzle Flapper
Pilot stage control	Internal control
Oil supply pressure	Minimum 14 bar, Maximum 315 bar
Proof pressure	Port P: 315 bar, Port T: 150 bar
Rated flow	40±10%L/min（at±10%L/min，ΔP_N=70 bar）
Resolution ratio	<1%(P_p=140 bar)
Hysteresis	<5%(Δp=140 bar)
Null shift	<4%（at ΔT=38°C) ＜3%（At 80-110% P_p change in supply pressure）
Maximum internal leakage	<3L/min(P_p=140 bar)
Zero Offset	＜2%
Freq. response	=-90°Phases＞50HZ（at P_p=210bar）

Electrical connection Electrical connection

The electrical connection can be in series or parallel, for safety and low coil inductance, parallel connection is recommended



Parallel connection　　Series connection　　Single connection

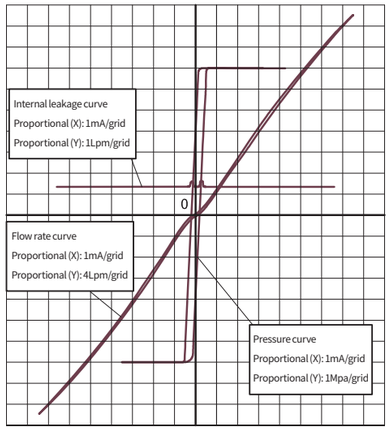
Wiring method	Parallel	Serial	Single
Coil resistance(Ω)	150	600	300
Rated current（mA)	±15	±7.5	±15
Coil inductance (at 60HZ)(H)	2	7	2
Electrical power(W)	0.03	0.03	0.068
Input polarity when the valve is P→B A→T	A and C(+) B and D(-)	A(+),D(-) B,C short connection	A(+），B (-) or C（+），D (-)

Coil Connection: The servo valve has a 4-prong electrical socket (matching the MS3106F14S-2S cable plug), and the 4 leads of the torque motor are all at the sowing base, so the torque motor coil can be connected in series, parallel or differential connection, when the coil is connected in series, the rated current is half of the parallel connection.

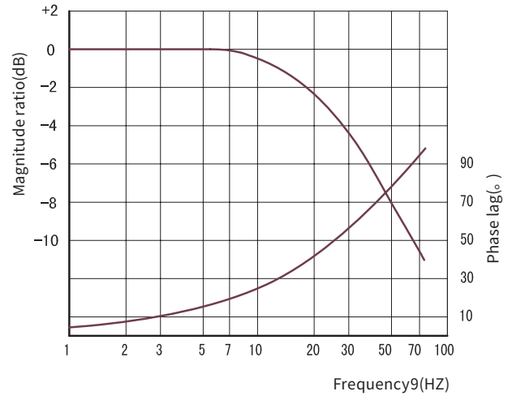
Servo Amplifier: Since the servo valve input is a current signal, a high internal resistance amplifier (with negative current feedback) must be used so that the effect of coil inductance and coil resistance changes on the current can be minimized.

Note: The pilot stage must establish the oil pressure before the electrical signal is input

Characteristic Curve (Measured at v=32 mm/s, θ=40 °C, pilot control pressure of 21 MPa)

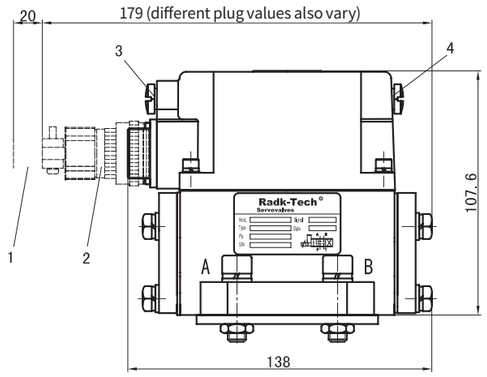


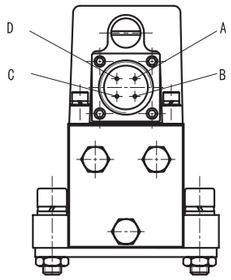
Static characteristic curve

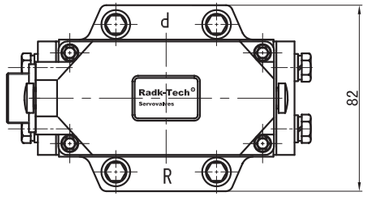


Frequency response measured at P_p=210 bar

Dimensions



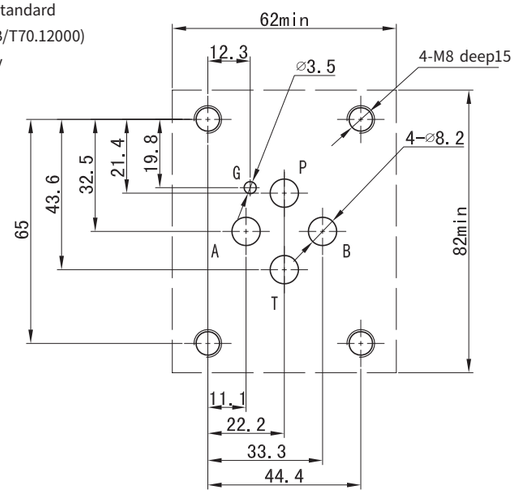


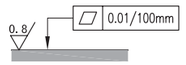


1 Disassembly plug space
2 4-pole plug (MS3106F14S-2S or other identical plugs, to be ordered separately)
3 4 zeroing port (the zero offset of the valve can be adjusted at the zeroing port, please consult when adjusting)

Mounting Size

Comply with IS010372-04-04-0-92 standard
Mounting screws: 4-M6X70 -10.9 (GB/T70.12000)
M_A=13N.m, to be ordered separately





Mounting surface machining accuracy



RT7625M



RT7325M



RT7625E

Twin flapper-nozzle electro-hydraulic servo valve

RT7625M
RT7625E
RT7325M

Size: 10
Maximum pressure: 31.5 MPa
Rated flow: 4-63 L/min ($\triangle P_N$=7 MPa)

Features and Benefits

- Suitable for closed-loop control of position, force and speed
- Frictionless double nozzle-baffle control stage
- High dynamic response
- High resolution, low hysteresis
- Dry torque motor and two stages of hydraulic power amplification.
- Optional external control for the Pre-amplifier
- Available with LVDT position electrical feedback and built-in amplifier
- Can be used as a 3-way valve
- Strong structure and long service life
- All adjustments are made at the factory

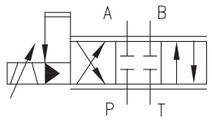
The output flow rate of the valve is related to the input command electrical signal and the pressure drop at the throttle of the valve. For a given valve pressure drop, the output flow rate of the valve can be calculated by the following equation

$$Q = Q_N \sqrt{\frac{\Delta P}{\Delta P_N}}$$

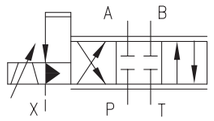
Q— Actual flow，L/min
Q_N — Rated flow，L/min
Δp — the actual pressure drop of the valve, MPa
$\triangle P_N$ — the rated pressure drop of the valve, MPa

Functional Symbols

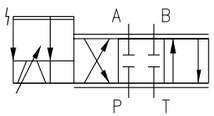
RT76/325M—...4...



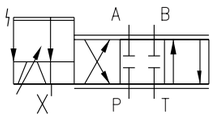
RT76/325M—...5...



RT7625E—...4...



RT7625E—...5...



Working Principle

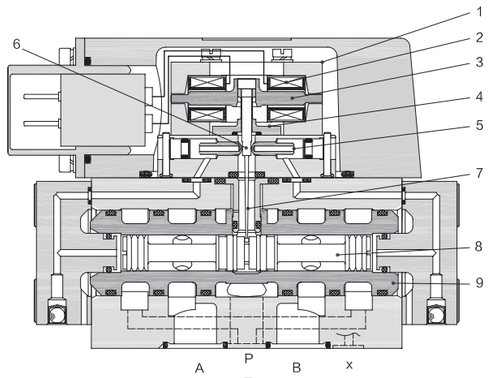
Can be used as three-way and four-way throttle type flow control valve, four-way when the best control performance, this valve is suitable for closed-loop control of position, force and speed.

Structure:

The valve consists of the following parts
-Pilot stage:
An electro-mechanical converter (torque motor) (1)
One hydraulic amplifier (consisting of nozzle (5), baffle (6))
-Power level:
spool (8), valve sleeve (9) and other components
-The spool is connected to the torque motor through mechanical feedback

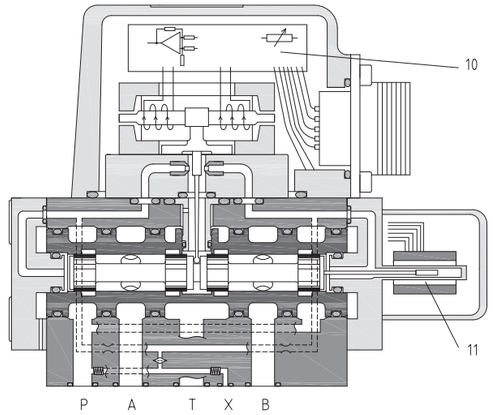
Working principle:

In the torque motor coil (2) input - electrical signal, will produce electromagnetic force on the armature (3) ends to form an electromagnetic torque, then the armature deflection drive pipe spring (4) and baffle (6) deflection, baffle deviation from the middle will reduce the flow of a nozzle (5), and then change the pressure of the spool (8) - side of the nozzle, resulting in pressure difference to push the spool to one side. The displacement of the spool opens the oil circuit between the supply port (P port) and a control port (A or B). At the same time, the displacement of the spool generates a force through the feedback lever (7) connected to the baffle, forming a return torque to the armature. When the return torque is balanced with the electromagnetic torque, the baffle returns to the neutral position, and the pressure on both sides of the spool is equal. The spool displacement is proportional to the size of the input electrical signal, and the load flow rate is proportional to the spool displacement at a constant pressure drop.



RT76/325M—...

These valves are mechanically controlled by a feedback lever tube spring, but also by a feedback and control of the electrical signal of the spool position. The spool position is obtained by an LVDT displacement sensor (11) and compared with a given signal value by a built-in amplifier (10). The built-in amplifier amplifies this control deviation and transmits it as a control signal to the pilot stage torque motor. With this additional electrical feedback, the closed-loop amplification of the electrical signal increases the loop gain, making it possible to achieve higher dynamic values in the small signal range than with the mechanical type. The mechanical feedback ensures that the spool can be located at the factory-set zero point in the event of a power supply failure.
The zero point of these valves can be adjusted by means of an open potentiometer adjustment port at the top cover or by a mechanical zeroing lever on the valve side.



RT7625E—...

Order Model Description

RT 76 2 5 M - **** . . . . . .

RT	Shanghai Radk-Tech Hydraulic system co. , ltd.

Servo Valve Model	
76	Standard type nozzle baffle secondary valve
73	Anti-corrosion high-pressure type nozzle baffle secondary valve

Mounting surface standard	
2	Mounting dimensions in accordance with ISO 10372

Latus rectum	
5	Latus rectum is 10mm

Feedback Type		
M	Mechanicl feedbacks	RT76/RT73..M
E	Charged feedback	RT76..E

Design code	
	Design Serial Number

Servo valve type	
Q	Flow valve (this item can be omitted)

Pressure Series	
G	14MPa
H	21Mpa
K	31.5Mpa
L	35MPa(Valve body is steel parts)

Flow(at △pN=7Mpa)	
4	4L/min
10	10L/min
19	19L/min
38	38L/min
50	50L/min
63	63L/min

Main valve spool function	
S	Standard
P	Positive covering
N	Negative covering
T	Special,customized to customer requirements

Power supply	
15	±15VDC

Command signal			
Feedback type M		Feedback type E	
N	±40mA(Parallel connection)	G	±10mA input ±10mA output
J	±40mA(series connection)	Y	Special Customization

Sockets Direction		Feedback type
A	Towards A	M E
B	Towards B	M E
P	Towards P	M
T	Towards T	M

Electrical sockets		Feedback type
4	Four-prong socket	M
6	6+PE	E

Coil connection method		Feedback type
B	Parallel	M E
C	Series	M
D	Single coil	M

Nominal resistance of coils		Feedback type
3	80Ω	M
5	200Ω	E

O-ring material	
N	Buna-N
V	Fluoroelastomer

Pilot stage control form	
4	Internal control internal exclusion
5	External control internal row

Power stage spool position in case of no signal or no oil supply	
F	P → B or A→T
D	P → A or B→T
M	Median
X	Other forms are available upon requst

Technical parameters

General Technical Data	
Operating pressure	port P、X、A、B: ⩽ 315 bar(K)
	port R: ⩽ 315 bar(K)
Temperature range	Storage temperature range: -20 to +80°C
	Ambient temperature range: -20 to +60°C
Seal material	NBR、FPM（other upon request）
Working medium	Mineral oil (HL, HLP) according to DIN 51 524, please consult for other hydraulic fluids
Fluid viscosity	15-100mm^2/s (priority 30-46 mm^2/s) Note: at 38°C
System filtration	High pressure filter without bypass and with alarm device shall be installed in the main oil circuit of the system. If possible, install the oil filter directly at the oil supply port of the servo valve
Recommended Fluid Cleanliness Grade	Regular use:ISO 4406＜14/11 Long-life use:ISO 4406＜13/10 (Oil cleanliness greatly affects the performance of the valve)

Technical parameters

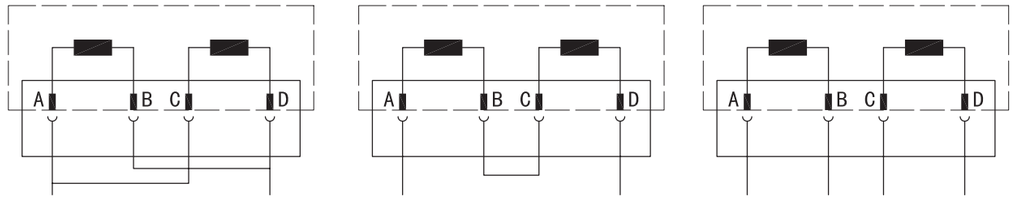
Filtration accuracy (Recommended Values)	Regular use:$\beta_{15} \geqslant 75$, Long-life use:$\beta_{10} \geqslant 75$
Installation requirement	Any position, fixed or moveable. Ensure that the pilot control system has sufficient pressure when the system is started(≥10bar)
Vibration resistance	30g, 3 axis
Weight (Including protection board)	RT7625M:1.1Kg RT7625E:1.3Kg RT7325M:1.88Kg
Degree of protection	EN6025: Class IP 65, with mating connector mounted
Protective base plate	With protective base plate

Static and dynamic data				
Model type		RT7625M-····	RT7625E-····	RT7325M-····
Mounting pattern		ISO10372-04-04-0-92		
Valve structure		Four-way two-stage servo valve with spool and sleeve		
Pilot stage		Nozzle Flapper		
Pilot stage control		Internal or external control		
Oil supply pressure	min	14bar		
	max	315 bar(K)		350bar（L）
Proof pressure	P-port	473bar		525bar
	T-port	315bar（K）		
Rated flow error		±10%（at ΔPN=70 bar)		
Symmetry		<10%（At Pp=140bar）	<10%（At Pp=210bar）	
Resolution ratio（At Pp=140bar）		<1%	<0.5%	<1%
Hysteresis（At Pp=70bar）		<4%	<1%	<4%
Rated signal		Parallel：±40mA	Input±10mA Output±10mA	Parallel：±40mA
Null shift		<2%（Temperature change 38°C) <2%（Oil supply pressure at 70 bar per change	<1%（Temperature change 38°C) <2%（Oil supply pressure at 70 bar per change	<2%（Temperature change 38°C) <2%（Oil supply pressure at 70 bar per change
Total internal leakage in zero position（At Pp=210bar）		<2.5L/min		
Zero Offset		RT7625M-003：-5~-3mA RT7625M-004：+5~+3mA	Median	Median
		In addition to the above examples, other forms can be provided according to customer requirements		
Leap ResponseLeap response (0 to 100% signal, measured At Pp=210 bar)		<6~13ms	<4ms	<6~13ms

Electrical connection

RT7625M/7325M-... Electrical connection

The electrical connection can be in series or parallel, for safety and low coil inductance, parallel connection is recommended



Parallel connection　Series connection　Single connection

Wiring method	Parallel	Serial	Single
Coil resistance(Ω)	40	160	80
Rated current（mA)	±40	±20	±40
Coil inductance (at 50HZ)(H)	0.1	0.36	0.12
Electrical power(W)	0.064	0.064	0.128
Input polarity when the valve is P→B A→T	A and C(+) B and D(-)	A(+),D(-) B,C short connection	A(+），B（-) or C（+），D（-)

Coil Connection: The servo valve has a 4-prong electrical socket (matching the MS3106F14S-2S cable plug), and the 4 leads of the torque motor are all at the sowing base, so the torque motor coil can be connected in series, parallel or differential connection, when the coil is connected in series, the rated current is half of the parallel connection.

Servo Amplifier: Since the servo valve input is a current signal, a high internal resistance amplifier (with negative current feedback) must be used so that the effect of coil inductance and coil resistance changes on the current can be minimized.

Note: The pilot stage must establish the oil pressure before the electrical signal is input

Powered Feedback RT7625E- ... Electrical Wiring

RT7625E series adopts 15V power supply, the socket used is 6+PE signal socket, its electrical characteristics are as follows:

General requirements

*Power supply 15VDC 3%, fluctuations of less than 50mVPp. maximum current consumption of ± 100mA.

*All signal lines, including the external transmitter connection, must use the screen number cable.

*The shield is connected to the power ground L(OV) by star grounding method, and connected to the housing of the supporting broadcast head (EMC).

*EMC: Meets EN55011/03.91 Class B, EN50081-1/01.92 Class A and EN50082-2/03.95 Class A standards. Considering the voltage loss on the wire between the valve and the controller, the cross section of the wire used is ⩾0.75mm2.

Note: When making electrical connections (shielding, protective earthing), valid measurements must be made to ensure that changes in the local earth potential do not cause excessive ground currents.

Voltage command signal:0~±10V

*he main spool displacement is proportional to (U_D-U_E). When (U_D-U_E)=+10V, the main spool is in the fully open position of P→A, B-→T. The spool is in the neutral position at 0V command signal.

*he input stage is a differential amplifier, and if the control signal is single-ended, pin D or E can be connected to the signal ground on the controller side, depending on the application.

Current command signal: 0~±10mA

*e main spool displacement is proportional to I_D=-I_E. When lD=+10mA, the main spool is in the fully open position of P-→A, B-→T. When 0mA command signal, the spool is in the neutral position.

*he D and E pins are inverted inputs. You can use only pin D or pin E depending on your needs. The unused pin is connected to the signal ground on the controller side.

Main spool actual displacement output signal: 0~±10V

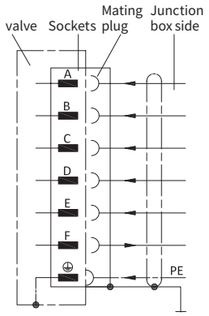
*he actual displacement of the main valve can be monitored by pin F in the socket. This displacement signal can be used for monitoring the valve operation and error detection. The displacement output of the main spool during the whole stroke is ±10V, which corresponds to the signal of +10V when the valve port is fully open and P-→A, B-→T.

Main valve spool actual displacement output signal: 0~±10mA

The actual displacement of the main valve can be monitored by the F pin in the socket, and this displacement signal can be used to monitor the valve operation and error detection. The displacement output of the main spool during the whole stroke is ±10mA, which corresponds to the signal of +10mA when the valve port is fully open and P-→A, B-→T.

Socket wiring diagram

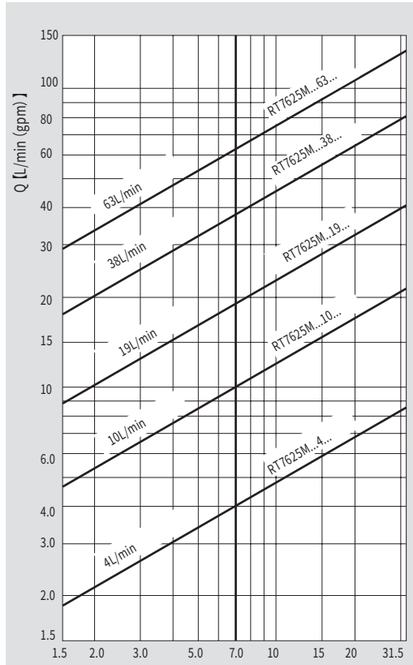
Plugs conform to EN175201-804 or MIL-DTL-5015 standards, to be ordered separately



Function	Current command	Voltage command
Supply	+15VDC±3%，Fluctuations＜50mVPP	
Supply	-15VDC±3%，Fluctuations＜50mVPP	
Power/signal ground	⊥	
Command signal	0 —±10mA(Load resistance 1kΩ)	0 —±10mA(Load resistance 1kΩ)
Reverse command signal	0 —±10mA(Load resistance 1kΩ)	0 —±10mA(Load resistance 1kΩ)
The actual displacement output signal of the valve spool	0 —±10mA(Max. Load resistance 1kΩ)	0 —±10mA(Max.Load resistance 1kΩ)
Earthing protection		

Characteristic Curve (Measured at v=32 mm/s, θ=40 °C)

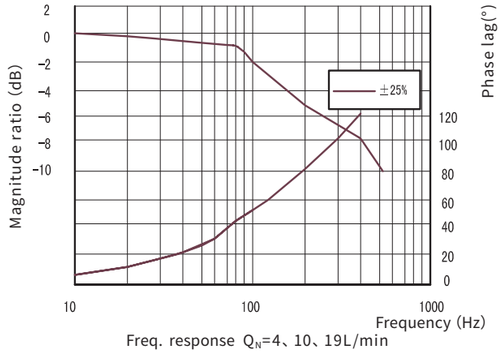
Flow Diagram



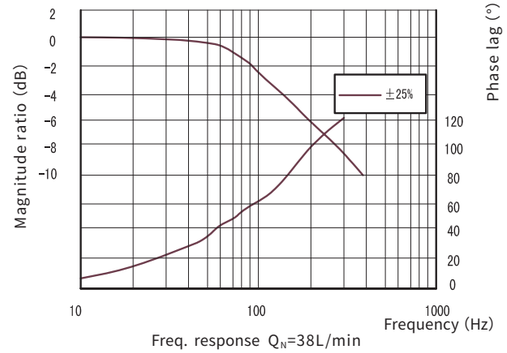
Load flow rate of the valve versus valve pressure drop when the valve port is fully open (100% of the given input signal)

Characteristic Curve (Measured at v=32 mm²/s, θ=40 °C, At Pp=210bar)

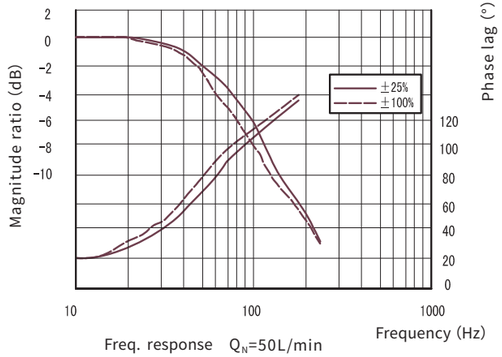
RT76/325M-····



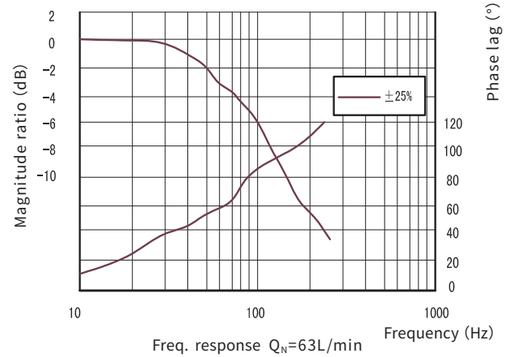
Freq. response Q_N=4、10、19L/min



Freq. response Q_N=38L/min

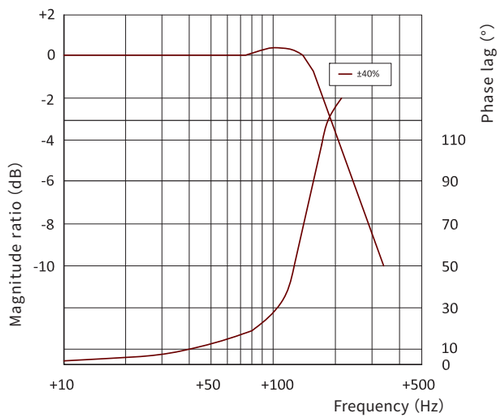


Freq. response Q_N=50L/min

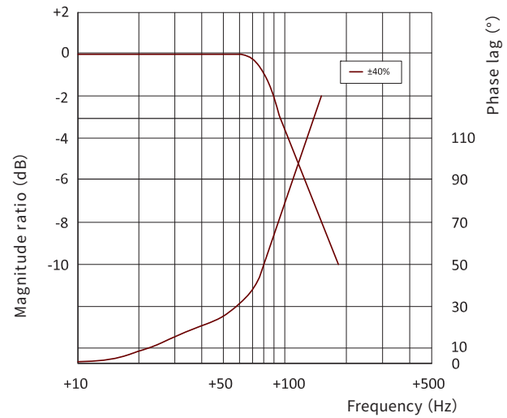


Freq. response Q_N=63L/min

RT7625E-····



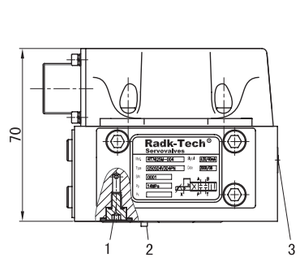
Frequency Response Q_N=38L/min

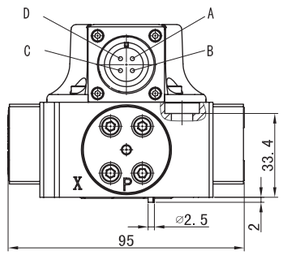


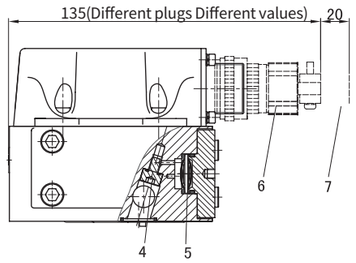
Frequency Response Q_N=63L/min

Dimensions and pilot control

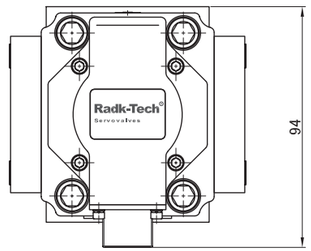
RT7625M-····







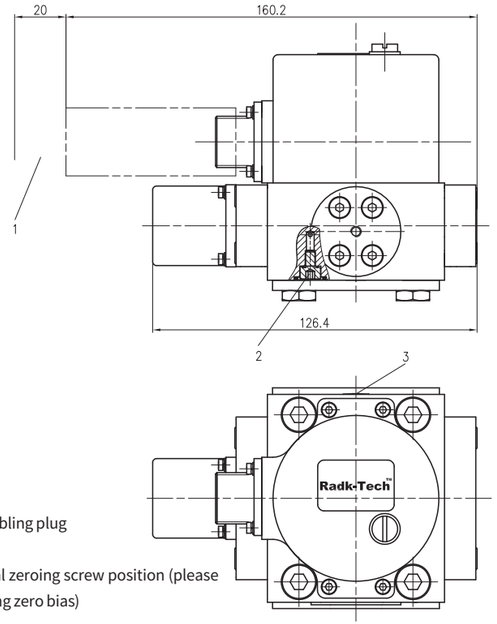
1 X-port screw plug
2 Positioning pin (middle 2.5X5)
3 External zeroing lever position (please consult when adjusting zero offset)
4 P-port screw plug
5 Folding filter
6 4-pole plug (MS3106F14S- 2S or other identical plugs, to be ordered separately)
7 Space for disassembling plug

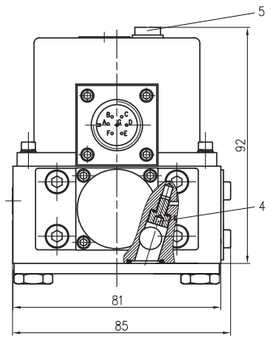


Pilot control

	X-port screw plug (1)	P-port screw plug(6)
Internal Control	Install	Disassemble
External Control	Disassemble	Install

RT7625E-····





1 .Space for disassembling plug
2 .X-port screw plug
3.External mechanical zeroing screw position (please consult when adjusting zero bias)
4 .P-port screw plug
5.External electrical zeroing potentiometer position

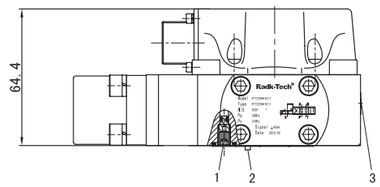
Description of pilot stage control mode conversion:

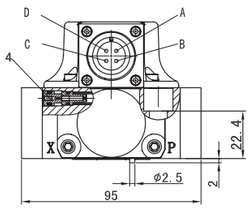
M4X6 plug open and close state as follows control

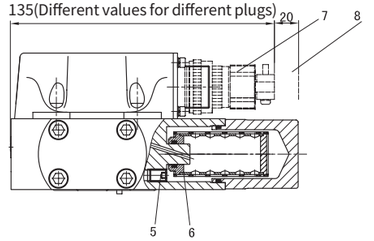
	X-port (2)	P-port (6)
Internal Control	closed	open
External Control	open	closed

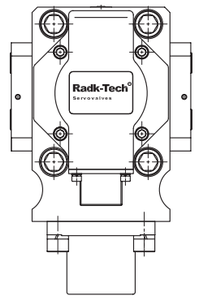
Dimensions and pilot control

RT7325M-····









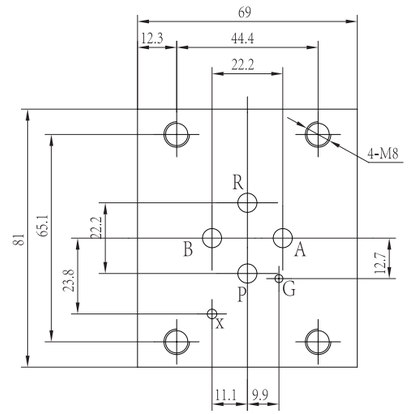
1 X-port screw plug
2 Positioning pin (2.5X5)
3 External zeroing lever position (please consult when adjusting zero bias)
4 Tubular filter
5 P-port screw plug.
6 Cartridge filter
7 4 cores (MS3106F14S-2S or other identical plugs, to be ordered separately)
8 Space for disassembling plug

Pilot control

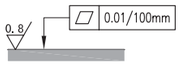
	X-port (2)	P-port (5)
Internal Control	closed	open
External Control	open	closed

Mounting Size

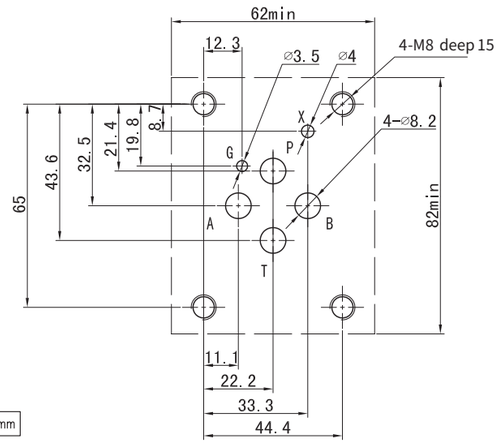
Comply with IS010372-04-04-0-92 standard
Mounting screws: 4-M8X50 -12.9 (GB/T70.1-2000) M_A=37 N.m, to be ordered separately



RT7625E



Mounting surface machining accuracy



RT76/325M-····



Twin flapper-nozzle electro-hydraulic servo valve

RTJ01

Maximum pressure: 21 MPa

Rated flow: 5 L/min

Features and Benefits

- Frictionless double nozzle-baffle front stage
- High dynamic response
- High resolution, low hysteresis
- Dry torque motor and two stages of hydraulic power amplification.
- Can work at low pressure (1.1 MPa)
- Compact structure，easy installation

The output flow rate of the valve is related to the input command electrical signal and the pressure drop at the throttle of the valve. For a given valve pressure drop, the output flow rate of the valve can be calculated by the following equation

$$Q = Q_N \sqrt{\frac{\Delta P}{\Delta P_N}}$$

Q— Actual flow，L/min

Q_N — Rated flow，L/min

Δp — actual pressure drop of the valve, MPa

$\triangle P_N$ — rated pressure drop of the valve, MPa

Working Principle

RTJ01 type two-stage electro-hydraulic servo valve can work at low pressure (1.1 MPa), with good dynamic response

Structure:

The valve consists of the following parts

-Pilot stage:

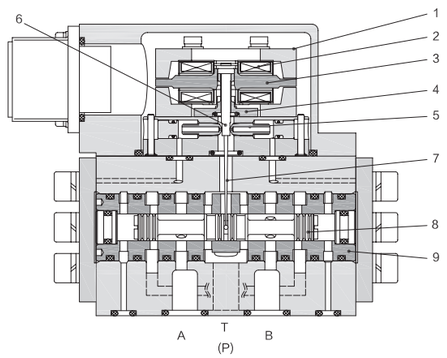
An electro-mechanical converter (torque motor)（1）

One hydraulic amplifier (consisting of nozzle (5), baffle (6))

-Power level:

spool (8), valve sleeve (9) and other components

-The spool is connected to the torque motor through mechanical feedback



Working principle:

In the torque motor coil (2) input - electrical signal, will produce electromagnetic force on the armature (3) ends to form an electromagnetic torque, then the armature deflection drive pipe spring (4) and baffle (6) deflection, baffle deviation from the middle will reduce the flow of a nozzle (5), and then change the pressure of the spool (8) - side of the nozzle, resulting in pressure difference to push the spool to one side. The displacement of the spool opens the oil circuit between the supply port (P port) and a control port (A or B). At the same time, the displacement of the spool generates a force through the feedback lever (7) connected to the baffle, forming a return torque to the armature. When the return torque is balanced with the electromagnetic torque, the baffle returns to the neutral position, and the pressure on both sides of the spool is equal. The spool displacement is proportional to the size of the input electrical signal, and the load flow rate is proportional to the spool displacement at a constant pressure drop.

Order Model Description

RT J01 – · · · · · · · · · · ·

RT	Shanghai Radk-Tech Hydraulic system co.，ltd.

Design code	
J01	Design Serial Number

Pressure Series	
T	Special

Flow(at △pN=11bar)	
5	5L/min

Main valve spool function	
S	Standard（Linear）

Power stage spool position in case of no signal or no oil supply	
M	Median

Pilot stage control form	
4	Internal control internal exclusion

Command signal	
N	+/-40mA

Sockets Direction	
A	Towards A

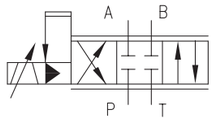
Electrical sockets	
4	Four-prong socket

Coil connection method	
B	Parallel

Nominal resistance of coils	
T2	63Ω

O-ring material	
N	Buna-N
V	Fluoroelastomer

Functional Symbols



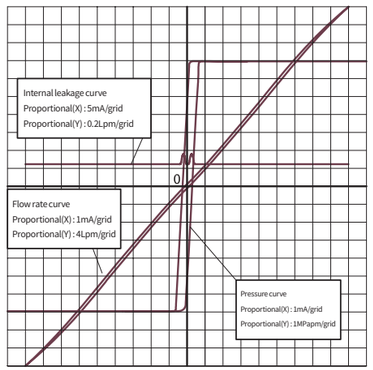
Technical parameters

General Technical Data	
Operating pressure	port P、A、B: ⩽ 210 bar
	port R: ⩽ 100 bar
Environmental magnetic field	⩽10 Gauss
Temperature range	Storage temperature range: -40 to +110°C
	Ambient temperature range: -40 to +110°C
Seal material	NBR、FPM（other upon request）
Working medium	No. 10 aviation hydraulic oil (SH0358-95), or use other hydraulic oil
System filtration	High pressure filter without bypass and with alarm device shall be installed in the main oil circuit of the system. If possible, install the oil filter directly at the oil supply port of the servo valve

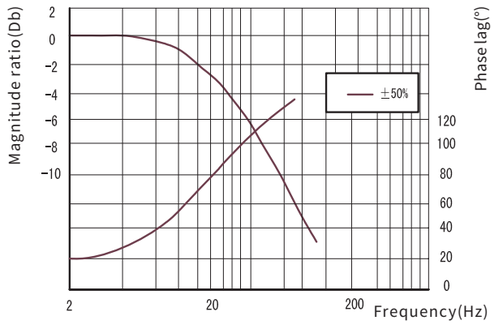
Technical parameters

Recommended Fluid Cleanliness Grade	Regular use:ISO 4406＜14/11 Long-life use:ISO 4406＜13/10 (Oil cleanliness greatly affects the performance of the valve)
Filtration accuracy (Recommended Values)	Regular use:$\beta_{10}\geqslant75$, Long-life use:$\beta_5\geqslant75$
Installation requirement	Can be fixed in any position or moved with the system
Vibration resistance	16g, 3 axis
Degree of protection	EN5052P: Class IP 65, with mating connector mounted
Protective base plate	When shipping With protective base plate
Static and dynamic data	
Model type	RTJ01
Valve body structure	Four-way two-stage servo valve with spool and sleeve
Pilot stage	Nozzle baffle type
Rated flow	5±10% (at $\triangle P_N$=11bar)
Symmetry	＜10%
Resolution ratio	＜1%
Zero Offset	⩽3%
hysteresis	＜4%
Pressure gain	⩾40%
Null shift	⩽3% (at 80-110% oil supply pressure)
Rated current	±40mA (Parallel)
Coil resistance	65±5Ω
Wiring method	parallel，A、C(+)，B、D(-)
Frequency characteristics	At rated pressure, the frequency width (-3dB) is not less than 20HZ
Polarity	B port output flow

Characteristic Curve (Measured at v=32 mm/s, θ=40 °C)

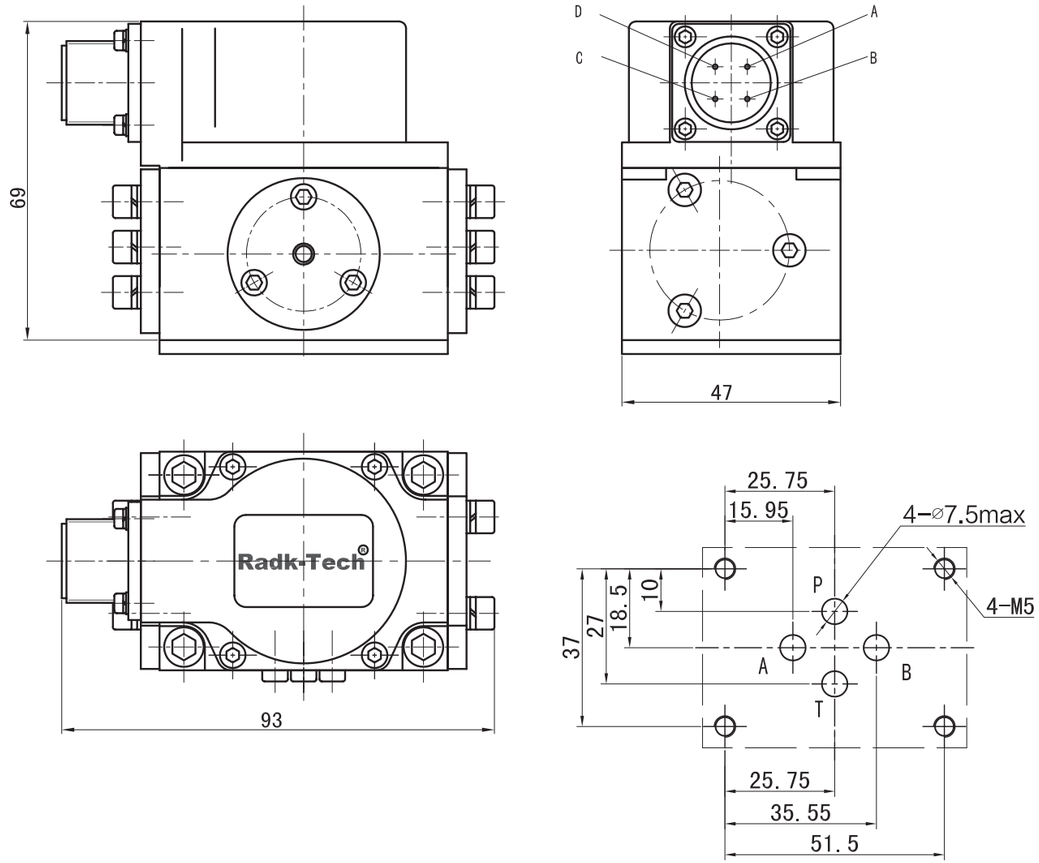


Static characteristic curve



Frequency response measured at P_p=110 bar

Dimention and mounting size



Mounting screws: 4-M5X45 -10.9 (GB/T70.1-2000)
M_A=8N.m, to be ordered separately



Mounting surface machining accuracy



Direct acting proportional servo valve
RT6313E

Size: 6
Maximum pressure: 31.5 MPa
Rated flow: 5-40 L/min (△ P_N=7 MPa)

Features and Benefits

- High thrust permanent magnet linear force motor directly drives the spool;
- Dynamic response independent of system pressure;
- No pilot flow required, lower power consumption;
- Low hysteresis and high resolution for excellent repeatability;
- Standard spool position monitoring signal;
- Electrical gas zeroing;
- When the valve is de-energized, the spool is restored to the neutral position by the centering spring, so that the load is in a safe state;

The output flow rate of the valve is related to the input command electrical signal and the pressure drop at the throttle of the valve. For a given valve pressure drop, the output flow rate of the valve can be calculated by the following equation

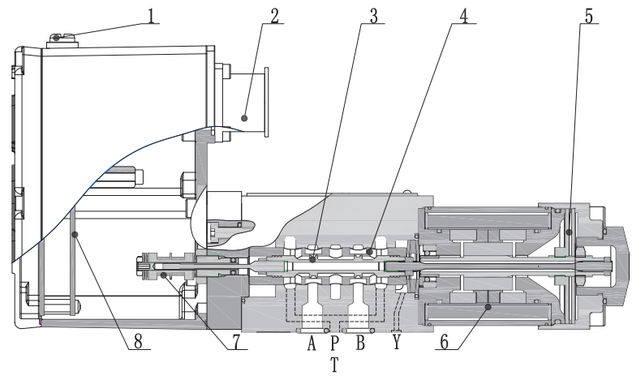
$$Q = Q_N \sqrt{\frac{\Delta P}{\Delta P_N}}$$

Q— Actual flow，L/min
Q_N — Rated flow，L/min
Δp — the actual pressure drop of the valve, MPa
$\triangle P_N$ — the rated pressure drop of the valve, MPa

Working Principle

The servo achieves closed-loop control of the spool position by means of a built-in LVDT position sensor, a linear force motor and a built-in amplifier. When the servo valve is energized with a control signal corresponding to the desired spool position, the built-in amplifier converts it into a corresponding pulse width modulated signal (PWM) to drive the linear force motor. Under the excitation of the oscillator, the LVDT position sensor fixed to the spool generates an electrical signal proportional to the spool position, which is demodulated and compared with the input command signal. The spool position is proportional to the command signal.

Structure :
The valve consists of the following parts.
Permanent magnetic linear force motor: centering spring (5), force motor assembly (6)
Power stage: spool (3), sleeve (4), etc.

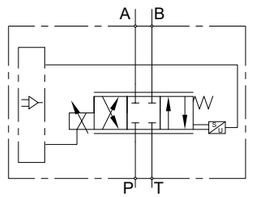


Working Principle

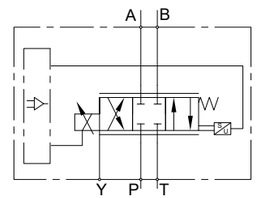
The working principle of permanent magnet linear force motor:
The linear force motor used in the RT6313E valve is a permanent magnet type differential motor (6). The permanent magnets provide some of the magnetic force for the force motor actuator, so the force motor requires less excitation current than the proportional solenoid. When the coil is not energized, the armature of the linear force motor is balanced in the neutral position by the magnetic field force in the left and right directions and the spring force in the center. When the coil is energized, the force on the armature is proportional to the displacement and the current of the coil.
The motor pushrod must overcome the large stiffness of the center spring force, the hydraulic force, and the friction caused by contaminants to drive the spool movement. The other solution is to work with the combination of proportional solenoid and reset spring, when the electromagnetic proportional solenoid to achieve the above two-way drive function requires two coils, but this will reduce the dynamic performance of the valve. Another option is to work with a combination of a proportional solenoid and a reset spring. When the solenoid is de-energized, the poppet will push the spool to reset and will experience a full open position of the valve, which may result in loss of load control.

Functional Symbols

RT6313E-···0···
Y-port internal oil return



RT6313E-···1···
Y-port external oil return



Technical parameters

General Technical Data	
Operating pressure	port P、X、A、B: ⩽ 315 bar(K)
	port R: ⩽ 315 bar(K)
Storage temperature range	-20°C-80°C
Seal material	NBR、FPM
Working medium	Petroleum-based hydraulic oil in accordance with DIN 51524, or hydraulic oil viscosity of 5 - 400 mm^2/s at 38°C (preferably 15 - 45 mm^2/s) according to user needs
System filtration	High pressure filter without bypass and with alarm device shall be installed in the main oil circuit of the system. If possible, install the oil filter directly at the oil supply port of the servo valve
Recommended Fluid Cleanliness Grade	Regular use:ISO 4406＜15/12 Long-life use:ISO 4406＜14/11 (Oil cleanliness greatly affects the performance of the valve)
Filtration accuracy (Recommended Values)	Regular use:β_{10} ⩾75 (10μ Absolute value) Long-life use:β_6 ⩾75(6μ Absolute value)
Installation requirement	Can be fixed in any position or installed with the system
Vibration resistance	30g, 3 axis
Weight (Including protection board)	2.5kg

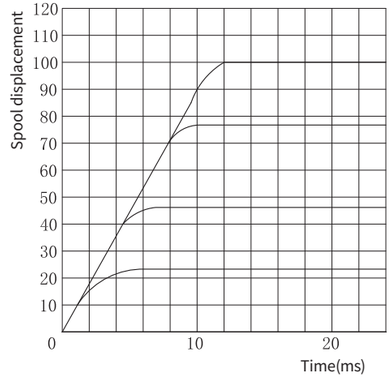
RADK-TECH

Technical parameters

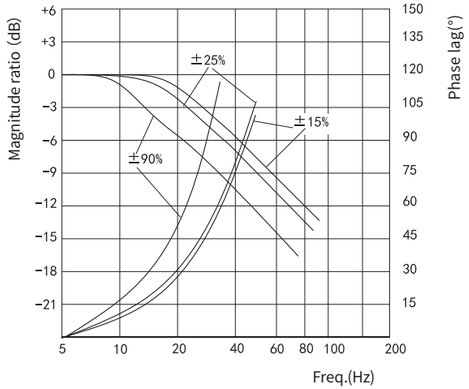
Static and dynamic data	
Model type	RT6313E
Leap Response	⩽12ms
Resolution ratio	⩽0.1%
hysteresis	＜1%
Null shift (at △T=55°C)	1.5%
Rated flow	5/10/20/40/min
Maximum internal leakage	0.15/0.3/0.6/1.2L/min

Characteristic Curve

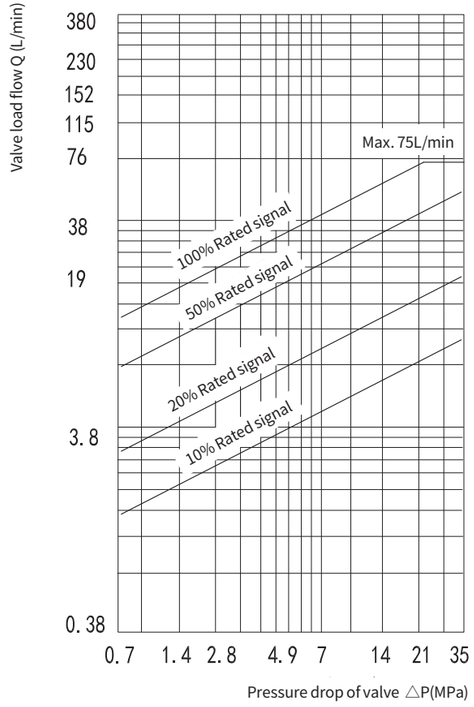
Leap Response



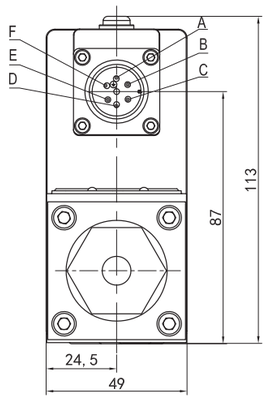
Freq. response

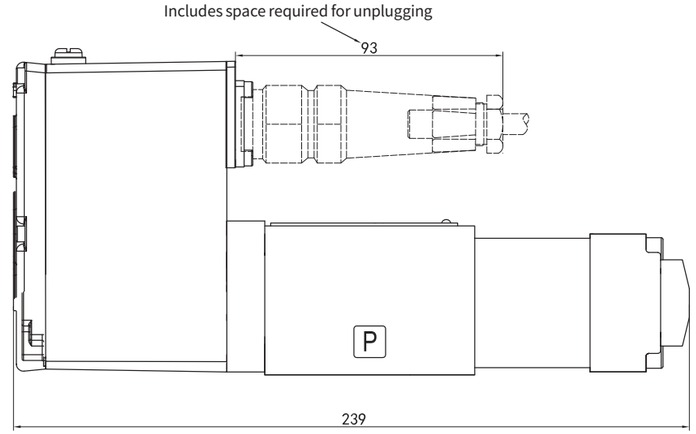


Load flow diagram of the valve



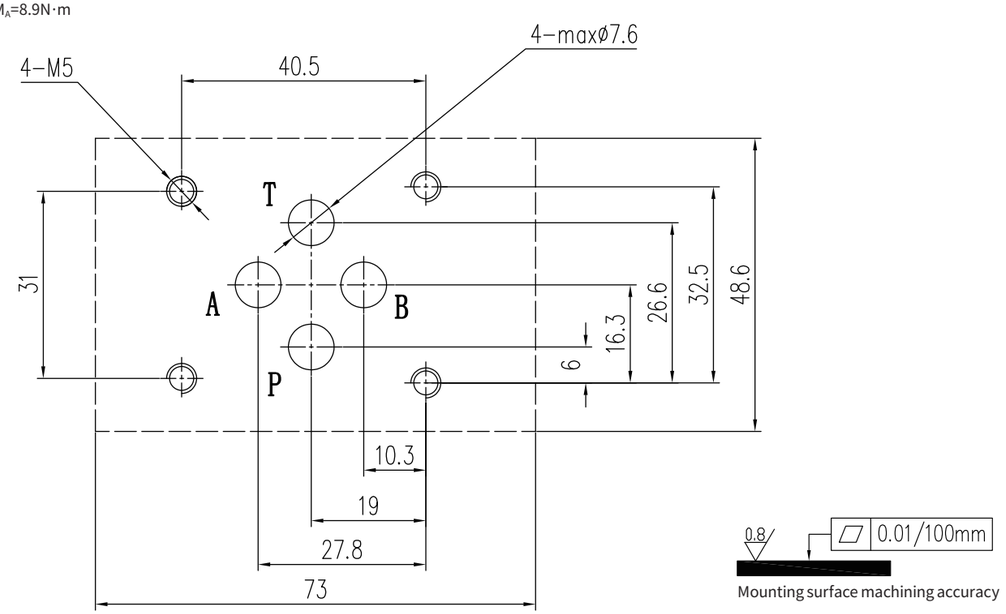
Dimension





Installation Size

Conforms to ISO4410-03-03-094
Mounting screws: 4-M5x50-10.9 (GB/T70.1-2000)
M_A=8.9N·m



Mounting surface machining accuracy

Electrical Characteristics

1. Supply voltage U:=+24 VDC (18~32 VDC)
Current consumption of RT6313E series is 1_{Amax}=1.2A
External fuse for valve 1.6A (delayed type)

2. Input Signal
2.1 Voltage command signal 0~±10V
Valve spool travel is proportional to (U_D-U_E)
(U_D-U_E) = +10V when the valve port is 100% fully open and port P communicates with port A and port T communicates with port B. For single-ended signals pin D or pin E can be connected to a reference potential (usually ground) depending on the desired flow direction.
2.2 Current command signal 0~±10mA (single-ended input)
Spool travel is proportional to I_D=-I_E
When the valve port is 100% fully open and the valve port P communicates with the valve port A and the valve port T communicates with the valve port B, I_{DB}=10mA. The current direction of D and E is opposite, so the D or E foot can be used according to the desired flow direction, and the unused foot is left hanging.
2.3 Current command signal 0~±10mA (differential input)
The spool travel is proportional to I_D=-I_E, the positive command input is connected to D, and the negative command input is connected to E.
When the valve port is 100% fully open and the valve port P communicates with the valve port A and the valve port T communicates with the valve port B, I_{DE}=10mA.
2.4 Current command signal +4~+20mA
Valve spool travel is proportional to (I_D-12mA)
When the valve port is 100% fully open and the valve port P communicates with the valve port A and the valve port T communicates with the valve port B, I_D = +20mA. when the valve port is fully open and the valve port P communicates with the valve port B and the valve port T communicates with the valve port A, I_D = +4mA.
Use pin D as signal input and pin E is left open.

3、Spool actual displacement monitoring output
I_F(+4…+20mA) corresponds to the actual displacement of the spool.
When the valve port is fully open and the valve port P communicates with the valve port A and the valve port T communicates with the valve port B, I_F=+20mA; When the valve port is fully open and the valve port P communicates with the valve port B and the valve port T communicates with the valve port A, I_F=+4Ma

4、All signal lines (including the external sensor connection) must use shielded cable. The shielded cable is connected to the power ground (0V) using the star grounding method, and connected to the shell of the socket (EMC)

5、EMC: meet the requirements of EN 55011/3.91 class B, and meet the standards of EN50081-1/01.92 and EN 50082-2/03.95 class A.

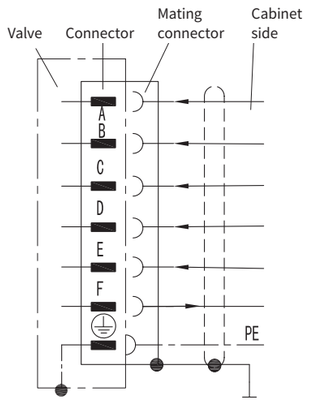
6. Protection grounding cable cross-sectional area 0.65mm²

7. When making electrical connections, effective measurements must be made to ensure that local ground potential changes do not cause excessive ground currents.

8、Protection level: in accordance with EN60529P standard, with matching plug protection level IP65 level.

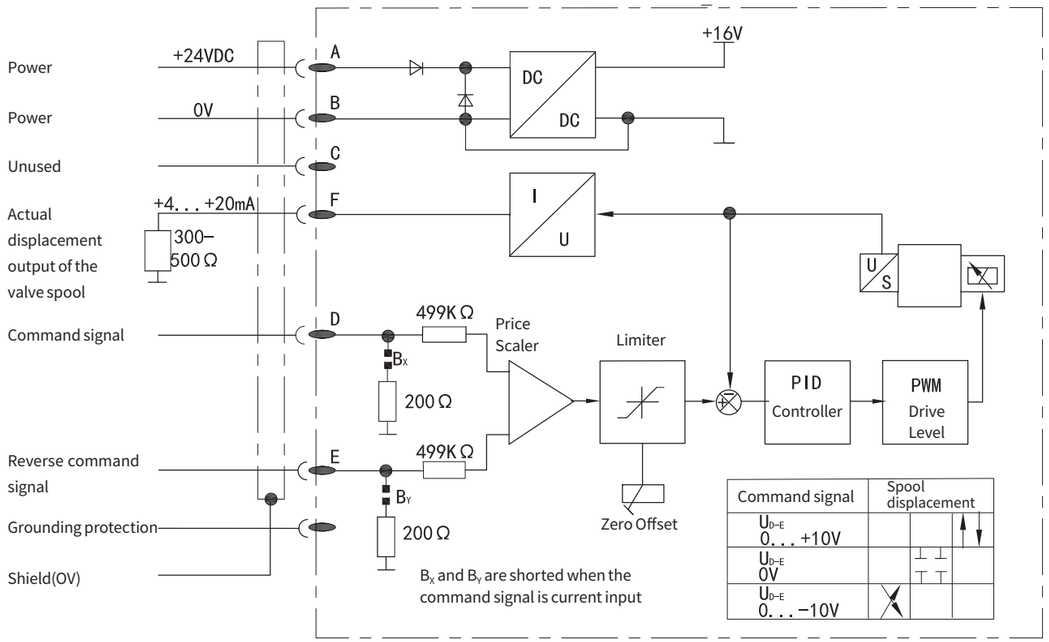
Socket wiring diagram

connector according to DIN 43563, to be ordered separately



Pin	Pin Function	Signal Type			
		M	X	P	U
		±10v	±10mA, Differential Inputs	±10mA, Single Ended to Ground	4-20mA
A	Power	Usupply=24VDC（18 to 32VDC), Reference GND			
B	GND	Power/ Signal Ground			
C	Not used	Not used			
D	Command signal +	U_{IN}=U_{DE} R_{IN}=10KΩ	I_{IN}=I_{DE} R_{IN}=200Ω	I_{IN}=I_{DB} R_{IN}=200Ω	U_{IN}=I_{DB} R_{IN}=200KΩ I_{MAX}=±
E	Command signal -	Reference D Pin	Reference D Pin	I_{IN}=I_{EB} R_{IN}=200Ω	No catch
F	Spool actual displacement output	I_{out}=4 to 20 mA,For reference GND, load resistance R_L=300-500			
G	Grounding Protection	Short connection to housing			

Block Diagram



Order Model Description

RT 63 1 3 E - **** · · · · · · · · ·

RT	Shanghai Radk-Tech Hydraulic system co. , ltd.

Servo Valve Model	
63	Direct-acting servo valve

Mounting surface standard	
1	Mounting dimensions in accordance with ISO 4401

Latus rectum	
3	Latus rectum is 6mm

Feedback Type	
E	With built-in amplifier

Design code	
	Design Serial Number

Maximum working pressure	
K	31.5MPa

Flow(at △PN=7Mpa)	
5	5L/min
10	10L/min
20	20L/min
40	40L/min

Main valve spool function	
S	Standard
P	Positive covering
N	Negative covering
T	Special,customized to customer requirements

Power supply	
2	±24VDC(18-32VDC)

Command signal		
	Input signal	Output signal
M	±10 VDC	+4-20mA
X	±10mA,Differential inputs	+4-20mA
P	±10 mA Single-ended input	+4-20mA
U	4-20mA	+4-20mA

Electrical sockets	
6	6+PE

O-ring material	
N	Buna-N
V	Fluoroelastomer

Y port	
0	Plugged by bolt, PtMax≤5MPa
1	Open, PtMAX>5MPa

Power stage spool position in case of no signal or no oil supply	
F	P→ B or A→T(Minimum opening is 10% of the full opening)
D	P→ A or B→T(Minimum opening is 10% of the full opening)
M	Median
X	Other forms are available upon requst



Model RT6615E...



Model RT6617E...



Model RT6619E...

Servo Proportional Valve
RT6615E
RT6617E
RT6619E

RT6615E

Maximum pressure: 35 MPa

Rated flow: 20-200 L/min (△ P_N=7 MPa)

RT6617E

Maximum pressure: 35 MPa

Rated flow: 120-250 L/min (△ P_N=1 MPa)

RT6619E

Maximum pressure: 35 MPa

Rated flow: 250-550 L/min (△ P_N=1 MPa)

Features and Benefits

- High flow acceptance efficiency (more than 90% of the pilot stage flow is utilized), resulting in lower energy consumption
- High dynamic response of the valve due to the high undamped natural frequency of the jet pipe pilot stage
- Reliable performance, high pressure recovery capability of the jet pilot stage (more than 80% of the pressure recovery capability when the rated signal is input), thus providing a larger driving force to the power stage spool and improving spool position accuracy
- The minimum control pressure of the pilot stage is only 25 bar, so it has the advantage that it can be used for low-pressure systems such as turbine control.
- The high frequency response of this series of valves and the good position accuracy of the power stage slide valve can improve the static performance of the control system.
- The pilot stage control oil can be controlled and discharged externally by X and Y port selection due to the large flow rate valve body flow path design.
- The main spool has a reduced driving area and has the following advantages:
  High dynamic response with small pilot stage flow rate, which also enables fast spool movement
- Position electrical feedback with LVDT
- For fail-safe type proportional valves, the slide valve can be reliably secured in a safe position by spring, seating valve, or cutting off external oil pressure.
- The RT661 series has two-stage and three-stage configurations, and the power-stage slide valve is driven by a single-stage or two-stage pilot servo valve. The two-stage RT661 series valves are mainly used in small signal requirements with The two-stage RT661 series valves are mainly used in systems requiring high resolution and high dynamic response at small signals, while the three-stage valves are suitable for applications requiring high dynamic response at larger command signals.

The output flow rate of the valve is related to the input command electrical signal and the pressure drop at the throttle of the valve. For a given valve pressure drop, the output flow rate of the valve can be calculated by the following equation

$$Q = Q_N \sqrt{\frac{\Delta P}{\Delta P_N}}$$

Q— Actual flow，L/min
Q_N— Rated flow，L/min
Δp — the actual pressure drop of the valve, MPa
△P_N— the rated pressure drop of the valve, MPa

Working Principle

Model RT6615E-... The valve can be used as a two-way, three-way and four-way throttle type flow control valve, the choice of jet pipe type pilot control stage, with excellent anti-pollution characteristics, and very good dynamic characteristics, suitable for closed-loop control of position, force and speed.

Structure:

The valve consists of the following parts

-Injector pilot stage: torque motor (1), injector tube (3) and receiver (5)

-Power stage: spool (6), sleeve (7), etc.

-Built-in amplifier (9)

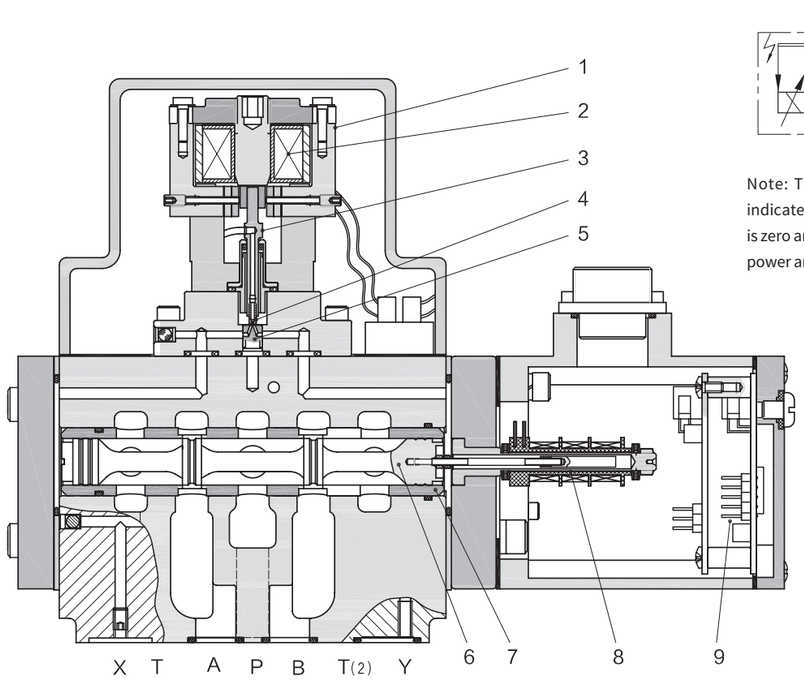
Working Principle:

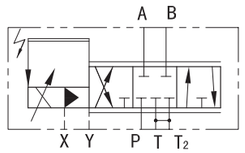
-In the torque motor (1) coil (2) input an electrical signal, will produce electromagnetic force to make the jet tube (3) on the nozzle (4) deflection, the tube out of most of the oil shot to the side of the receiver, and the receiver of the other - side to accept the flow of reduced, thus changing the pressure of the two ends of the spool (6) connected to the cavity, the pressure difference to the spool (6) displacement, the oil port P to A (or B) and B (or A) to T open, the pilot stage drain from the nozzle (4) ring around the discharge, back to the tank. The pilot stage drain is discharged from the nozzle (4) around the ring and back to the oil tank.

-The spool (6) position is controlled by the built-in amplifier (9) and the signal feedback from the displacement sensor (8) connected to the spool to achieve closed loop control.

-When the command signal is input, the spool with the displacement sensor produces displacement, and the modulation and demodulation line of the displacement sensor detects the actual displacement of the spool and outputs it in the form of a voltage proportional to the displacement, and feeds it back to the control circuit to compare with the command signal until the displacement output signal is equal to the command signal and the deviation signal is zero, then the jet pipe (3) returns to the neutral position and the spool stops moving. The spool output flow is proportional to the command signal.

RT6615E



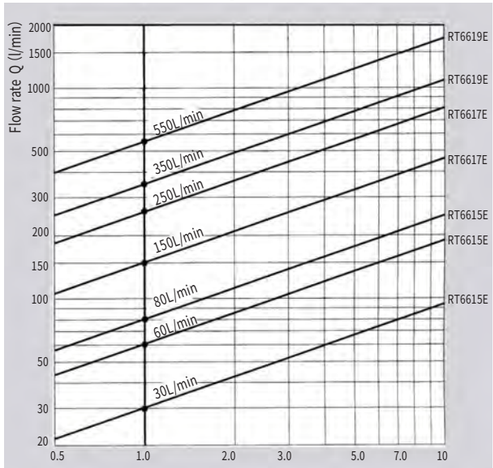


Note: The function symbol here indicates that the command signal is zero and the valve is supplied with power and pilot stage pressure.

General technical parameters

General Technical Data	
Operating pressure	port P、A、B: ⩽ 350 bar
	port T: ⩽ 315 bar(K)
Temperature range	Fluid: -20 to +80°C Ambient : -20 to +60°C
Seal material	NBR、FPM（other upon request）
Working medium	Mineral oil (HL, HLP) according to DIN 51 524, please consult for other hydraulic fluids
Oil viscosity	Allowable value 5-400mm²/s (15-45mm²/S preferred)
System filtration	Pilot stage or pilot valve: choose a high-pressure oil filter (no bypass valve, with contaminant clogging alarm) to be installed in the system's main oil circuit, as far as possible at the valve's inlet
Power stage slide valve	Choose the same high-pressure oil filter as the pilot valve, if the system is used to quickly adjust the variable pump, it is recommended to install the use of external system circulation filter
Recommended Fluid Cleanliness Grade	Regular use:ISO 4406＜1999＜16＜13 Long-life use:ISO 4406＜1999＜14＜11
Filtration accuracy (Recommended Values)	Regular use:β_{15} ⩾75 Long-life use:β_{10} ⩾75
Installation requirement	Can be fixed in any position or installed with the system
Vibration resistance	30g, 3 axis
Protection grade	Comply with EN60529P standard, IP65 level of protection with matching plug
Protecting the base plate	With protective base plate

Load flow diagram of the valve



Rated pressure drop ΔP_N=10bar　　Valve pressure drop ΔP[bar]

Valve flow diagram

Valve flow for maximum valve opening (100 % command signal) as a function of the valve pressure drop

Electrical connection

RT6615E、RT6617E and RT6619E series valve electronics with supply voltage 24 volt and 6+PE pole connector

- Supply 24 VDC, min.18 VDC, max.32 VDC. Current consumption max.300 mA
- All signal lines, also those of external transducers, shielded.
- Shielding connected radially to⊥(OV, power supply side, and connected to the mating connector housing (EMC).
- EMC: Meets the requirements of emissionEN55011:1998+A1:1999(limit class B) and immunity:EN61000-6-2:1999. Minimum cross-section of all leads 0,75 mm² Consider voltage losses between cabinet and valve.
- Note: When making electric connections to the valve (shield, protective earth) appropriate measures must be taken to ensure that locally different earth potentials do not result in excessive ground current.

Command signal 0 to±10 mA floating,Valves with current command input

The spool stroke of the valve is proportional to I_D= -I_E.100 % valve opening P→A and B→T is achieved at I_D= +10mA. At 0 mA command the spool is in centred position.

The input pins D and E are inver-ting. Either pin D or E is used according to the required ope-rating direction. The other pin is connected to signal ground at cabinet side.

Electrical connection

Command signal 0 to ±10 V,Valves with voltage command input

The spool stroke of the valve is proportional to (U_D- U_E).100 % valve opening P→A and B→T is achieved at(U_D-U_E)=+10V. At 0 V command the spool is in centred position.

The input stage is a differential amplifier. If only one command signal is available, pin D or E is connected to signal ground at cabinet side, according to the required operating direction.

Actual value 4 to 20 mA

The actual spool position value can be measured at pin F (see diagram below). This signal can be used for monitoring and fault detection purposes.

The spool stroke range corres-ponds to 4 to 20 mA.

The centred position is at 12 mA.20 mA corresponds to 100 % valve opening P→A and B→T.

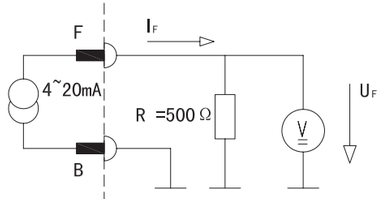
Note: Enable input

With enable signal off, the main spool will move to a safe position.

a) Centred position(unbiased pilot valve)function code A[1])

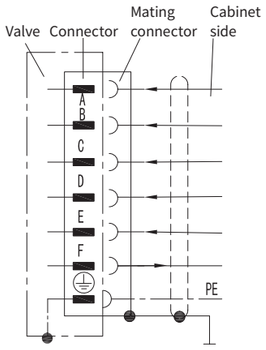
b) End position(biased pilot valve)function code B[1])

Circuit diagram for measu-rement of actual value I_F(position of main spool)for valves with 6+PE pole connector



Wiring diagram with 6+PE socket

Plugs conform to EN 175201-804 or MIL-DTL-5015, to be ordered separately

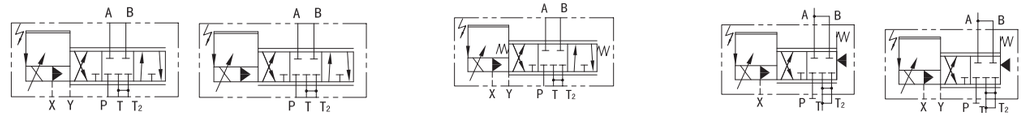


Function	Current command	Voltage command
Supply	24 VDC (min. 18 VDC, max. 32 VDC).I_{max}= 300 mA	
Supply / Signal ground	⊥(0V)	
Enabled Not enabled	U_{C-B}> +8,5 VDC U_{C-B}< +6,5 VDC I_e= 2,0 mA at 24 VDC (see note above)	
Input rated command (differential)	Input command I_D=-I_E:0 to±10mA Input command (inverted) I_E=-I_D:0 to±10mA (R_e=200Ω)	U_{D-E}=0 to±10V R_e=10 kΩ
	Input voltage for U_{D-B} and U_{E-B} for both signal types is limited to min. -15 V and max. +32 V	
Output actual value spool position	I_{F-B}= 4 to 20 mA. At 12 mA spool is in centred position. R_L = 100 to 500 Ω	
Protective earth	Signal code D (see page 23): U_{F-B} = 2 to 10 V. At 6 V spool is in centred position. R_a = 500 Ω	

RT6615E

Static and dynamic data	
Mounting pattern	ISO4401-05-05-0-94,with additional port X、Y
Valve body structure	Four-way two-stage servo valve with spool and sleeve
Pilot stage	Servo jet pipe valve
Pilot connection	Internal or external control (X-port and Y-port) is available
Operating pressure	Valve ports P,A and B (X-port external control): ⩽ 350 bar Oil ports T, T_2 (Y-port internal discharge): 210 bar Oil ports T, T_2 (Y-port external discharge): ⩽ 350 bar
Weight	5.6kg
Operating pressure	Valve port P, A, B (X port external control): ⩽ 350 bar
Rated flow	90±10%L/min, extended flow series 20, 40, 20, 60, 120, 160, 200L/min（At △P_N=70bar）
Threshold	＜0.1%
Symmetry	＜10%
Hysteresis	⩽1%
Null shift	＜2%（Temperature change △T=55℃）
Leap Response	＜10ms（0-100%，P_p=210bar）
Zero internal leakage	⩽4.5L/min（P_p=210bar）
Pilot stage internal leakage	⩽1.7L/min（P_x=210bar）

Functional Symbols



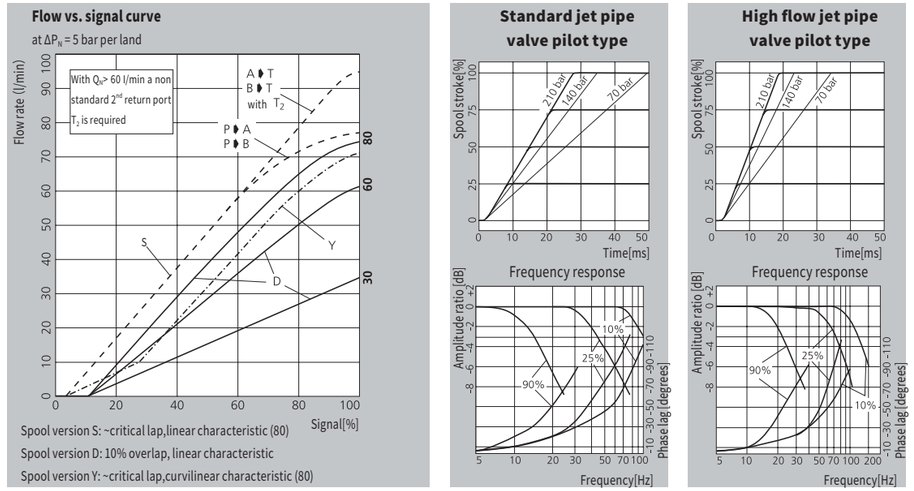
4-way version
(2nd T port required with Q_N>60l/min)

4-way version spring centred
(2nd T port required with Q_N>60l/min)

2x2-way version

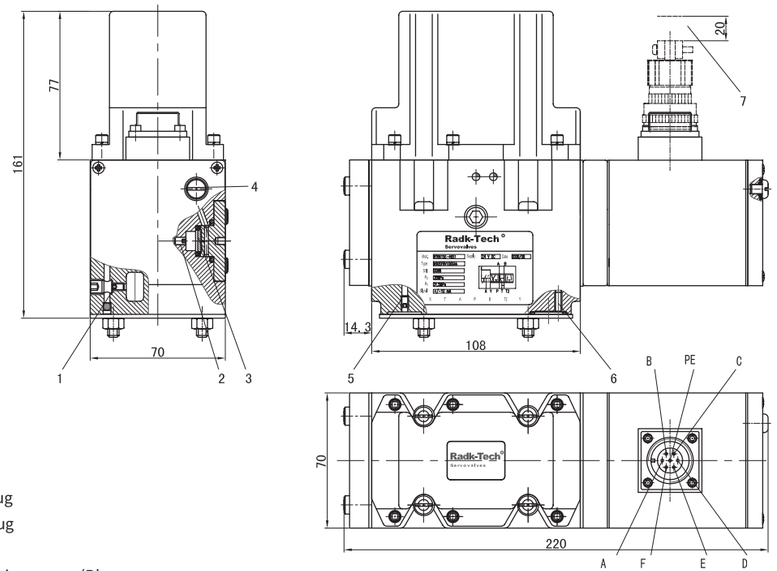
Characteristic Curve

(Measured at v=32 mm²/s, θ=40 °C, Measured at pilot control pressure or system pressure of 21 bar)



RT6615E

Dimensions and pilot control

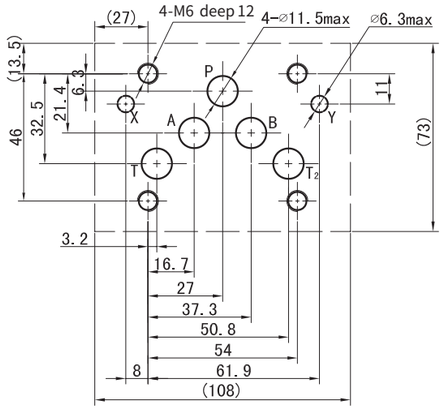


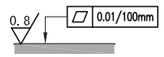
1 T-port screw plug
2 P-port screw plug
3Folding filter
4 Electrical zeroing cover (Please consult when adjusting)
5 X-port screw plug
6 Y-port screw plug.
7 Space for disassembling plug

Pilot control（Screw plug is M4)

	P-port screw plug(2)	T-port screw plug(1)	X-port screw plug(5)	Y-port screw plug(6)
Internal Control	dismantle	dismantle	Install	Install
Internal Control	dismantle	Install	Install	dismantle
External Control	Install	dismantle	dismantle	Install
External Control	Install	Install	dismantle	dismantle

Mounting Panel Dimensions





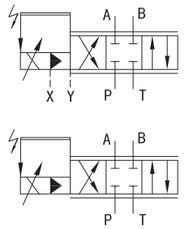
Mounting surface machining accuracy

Conforms to ISO4401-05-05-0-94 standard
Mounting screws: 4-M6X55-12.9 (GB/T70.1-2000)
M_A=13N.m

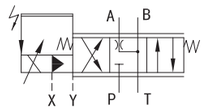
RT6617E

Static and dynamic data				
Mounting pattern			ISO4401-07-06-0-94	
Valve body Version			Generally a four-way two-stage servo valve with spool and sleeve	
Pilot stage			RT6111 model Jet pipe valve	RT7613 model Two-stage servo valve
Pilot connection			Optional，internal or external	
Operating pressure	**Main stage**	Ports P with X external ,A,B	⩽350bar	⩽350bar
		Ports T with Y internal	⩽140bar	⩽210bar
		Ports T with Y external	⩽350bar	⩽350bar
	Pilot stage	Regular version ,ports P,A,and B	⩽280bar	⩽280bar
		Port T	⩽140bar	⩽210bar
Threshold(P_p=210bar)			⩽0.2bar	⩽0.4bar
Hysteresis(P_p=210bar)			⩽1bar	⩽2bar
Null shift(P_p=210bar,△T=38°C)			⩽3bar	⩽4bar
Leap Response（Full stroke）			30ms	10ms
Null internal leakage flow（P_p=210bar)			⩽5.1L/min	⩽4.5L/min
Spool drive area			2cm²	5cm²

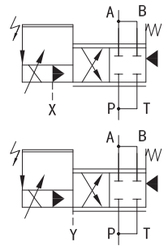
Functional Symbols



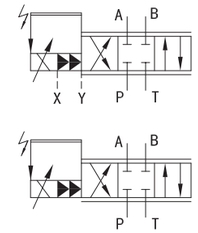
4-way version
Optional pilot control method



4-way version spring centred
(fail-safe version M if Px⩽1bar,
only with X and Y external



2x2-way version （option external port)

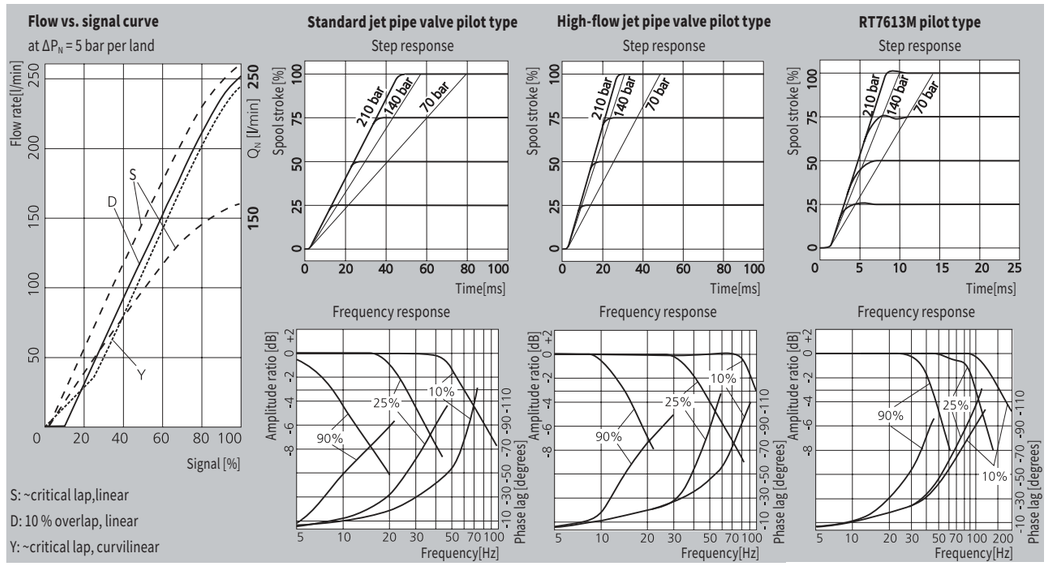


4-way version 3-stage valve
(optional pilot control method)

RT6617E

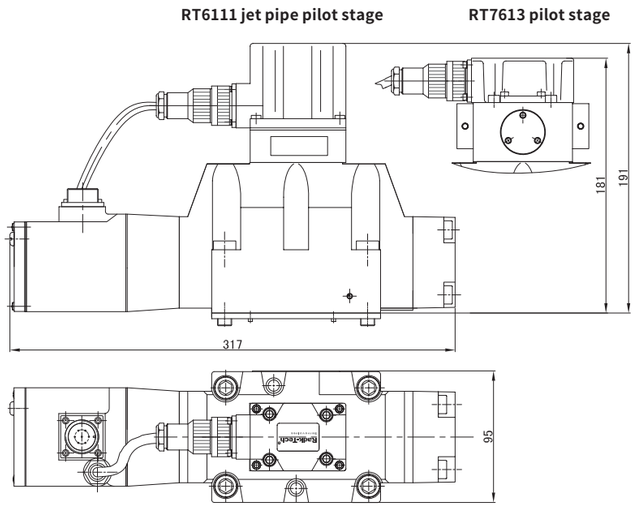
Characteristic Curve

(Measured at v=32 mm²/s, θ=40 °C, Measured at pilot control pressure or system pressure of 21 bar)



S: ~critical lap,linear
D: 10 % overlap, linear
Y: ~critical lap, curvilinear

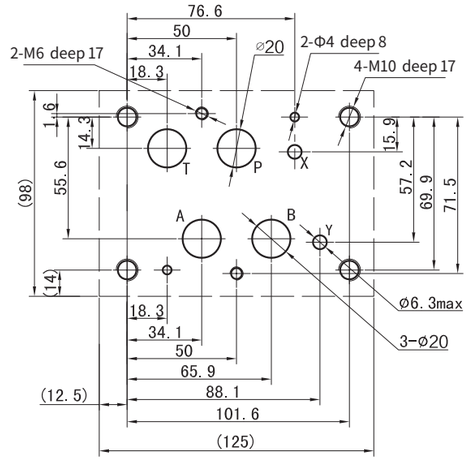
Dimension

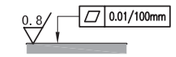


Note: Pilot stage valve RT7613 series only for RT6617E, RT6619E three-stage valve series, RT6617E, RT6619E two-stage valve pilot stage for the jet pipe valve

RT6617E

Mounting Dimensions





Mounting surface machining accuracy

Conforms to ISO4401-07-06-0-94 standard
Mounting screws: 4-M10X55-12.9 (GB/T70.1-2000)
M_A=65N.m

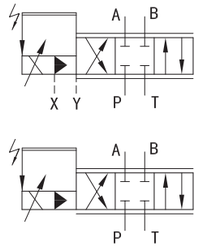
RT6619E

Static and dynamic data					
Model type			RT6619E		
Mounting pattern			ISO4401-07-06-0-94		
Valve body Version			Generally a four-way two-stage servo valve with spool and sleeve		
Pilot stage			RT6111 model Jet pipe valve	RT7613 model Two-stage servo valve	RT7613 model Two-stage servo valve
Pilot connection			Optional，internal or external		
Operating pressure	**Main stage**	Ports P with X external ,A,B	⩽350bar	⩽350bar	⩽350bar
		Ports T with Y internal	⩽140bar	⩽210bar	⩽210bar
		Ports T with Y external	⩽280bar	⩽280bar	⩽280bar
	Pilot stage	Regular version ,ports P,A,and B	⩽280bar	⩽280bar	⩽280bar
		Port T	⩽140bar	⩽210bar	⩽210bar
Rated flow（±10%，at△P_N=10bar)			350L/min	250L/min	550L/min
Threshold(P_p=210bar)			⩽0.2%	⩽0.4%	⩽0.4%
Hysteresis(P_p=210bar)			⩽1%	⩽2%	⩽2%
Null shift(P_p=210bar,△T=38°C)			⩽3%	⩽4%	⩽4%
Leap Response（Full stroke)			37ms	13ms	17ms
Null internal leakage flow（P_p=210bar)			⩽5.6L/min	⩽5L/min	⩽5L/min
Spool drive area			2.8cm²	11.4cm²	11.4cm²
Main spool stroke			±4.5mm	±4.5mm	±6mm

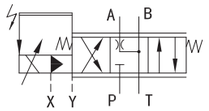
RT6619E

Functional Symbols

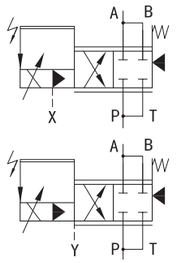
4-way version
Optional pilot control method



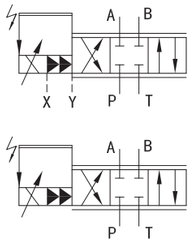
4-way version spring centred
(fail-safe version M if Px≤1bar,
only with X and Y external



2x2-way version
(option external port)



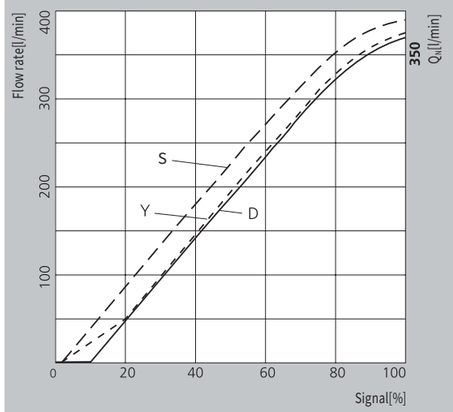
4-way version 3-stage valve
(optional pilot control method)



Characteristic Curve

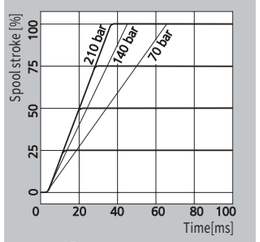
(Measured at v=32 mm²/s, θ=40 °C, Measured at pilot control pressure or system pressure of 21 bar)

Flow vs. signal curve
at ΔP_N = 5 bar per land

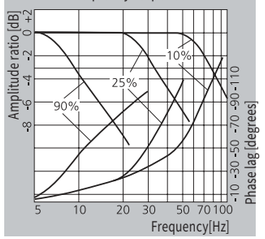


Spool version S : ~critical lap, linear characteristic
Spool version D : 10 % overlap, linear characteristic
Spool version Y : ~critical lap,curvilinear characteristic

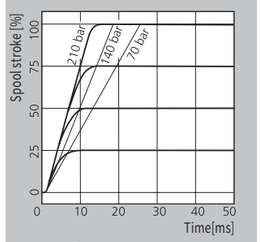
Standard jet pipe valve pilot type
Step response



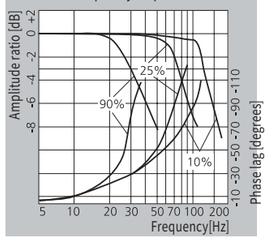
Frequency response



RT7613 Pilot
Step response

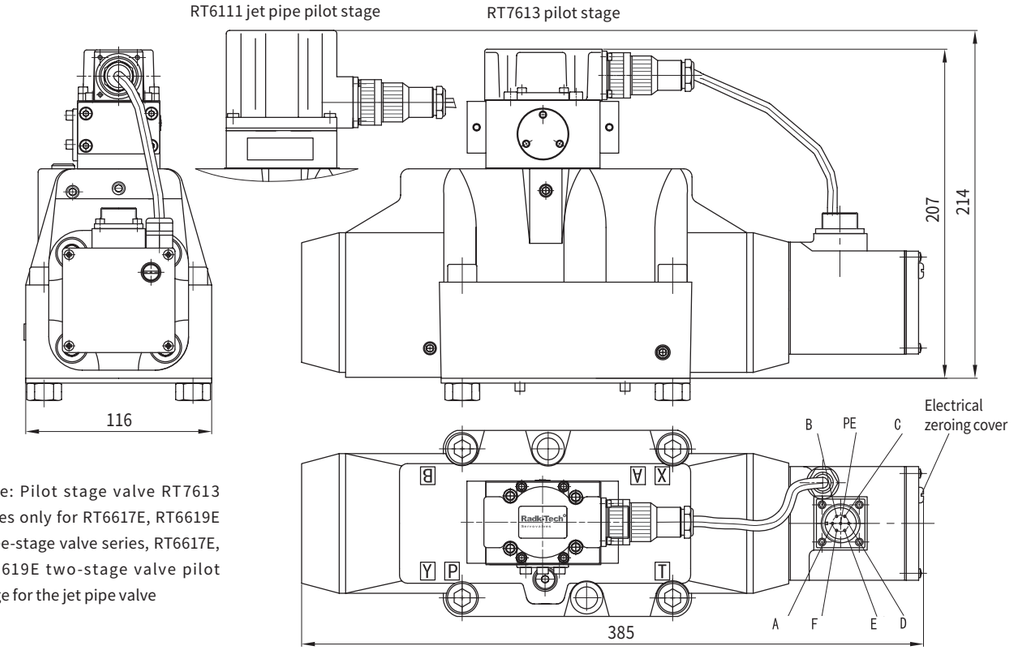


Frequency response



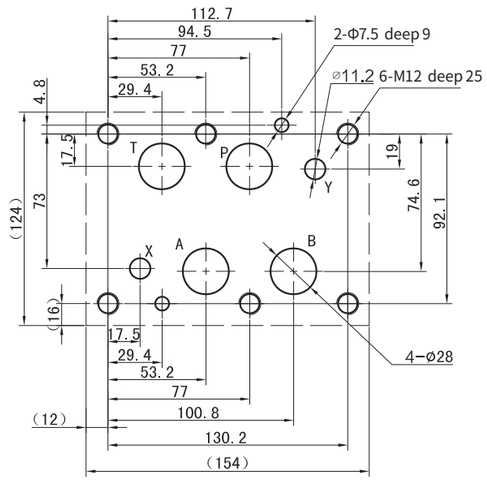
RT6619E

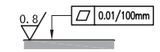
Dimension



Note: Pilot stage valve RT7613 series only for RT6617E, RT6619E three-stage valve series, RT6617E, RT6619E two-stage valve pilot stage for the jet pipe valve

Mounting Panel Dimensions





Mounting surface machining accuracy

Conforms to ISO4401-08-07-0-94 standard
Mounting screws: 4-M12X75-10.9 (GB/T70.1-2000)
M_A=110N.m

Order Model Description

RT 66 1 · E - **** · · · · · · · · · · · · · · ·

RT	Shanghai Radk-Tech Hydraulic system co., ltd.

Servo Valve Model	
66	Pilot-controlled servo-proportional valve with jet pipe or RT7613 as pre-stage

Mounting surface standard	
1	Mounting dimensions in accordance with ISO 4001

Latus rectum	
5	Latus rectum is 10mm
7	Latus rectum is 16mm
9	Latus rectum is 25mm

Feedback Type	
E	Charged feedback

Design code	
	Design Serial Number

Servo valve type	
Q	Flow valve (this item can be omitted)

Pressure Series	
J	28MPa
K	31.5Mpa
L	35Mpa
T	Special,customized to customer requirements

Flow	RT6615E (at △pv=70Mpa)	RT6617E (at △pv=10Mpa)	RT6619E (at △pv=10Mpa)
20	20L/min	120 120L/min	250 250L/min
40	40L/min	150 150L/min	350 350L/min
60	60L/min	200 200L/min	550 550L/min
90	90L/min	250 250L/min	
120	120L/min		
160	160L/min		
	Special order available		

Main valve spool function	
S	Standard(zero masking,linear flow gain)
D	10% Positive masking,linear flow gain characteristics
P	Positive covering
N	Negative covering
Y	Zero-coverage,folded line flow gain characteristics
T	Special,customized to customer requirements

Type of pilot stages or pilot valves	
A	Pilot valve is a standard jet pipe valve
B	Pilot valve is a high flow type jet pipe valve
M	Pilot valve is RT7613M series valve
N	Pilot valve is RT7613M series valve,but the dynamic is higher than M type

Valve position without enable signal	
A	Spool moves to adjustable neutral position when there is no enable signal
B	Spool moves to A→T or B→T when there is no enable signal
N	No such requirement

Corresponds to 100% rated displacement signal of the main spool	Command signal	Output signal
X	+/-10mA	4-20mA
A	+/-10VDC	+/-10VDC
M	+/-10VDC	4-20mA
D	+/-10VDC	2-10VDC
Y	Special	

Sockets Direction	
A	Towards A
B	Towards B

Electrical sockets	
6	6+PE

Coil connection method		Feedback type
B	Parallel	A B
D	Single coil	M N

Nominal resistance of coils		Feedback type
1	16Ω	A,B
3	80Ω	M,N

O-ring material	
N	Buna-N
V	Fluoroelastomer

Pilot oil form	
4	Internal control internal exclusion
5	External control internal row
6	External control external exclusion
7	Internal control internal row

Power stage spool position in case of no signal or no oil supply	
F	P → B or A→T
D	P → A or B→T
M	Median
O	No such function
X	Other forms are available upon request

Radk-Tech

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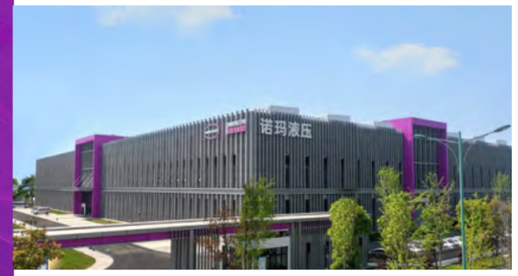
Please scan QR code for more information and follow WhatsApp official account.



Minhang Factory,Shanghai,China



Lingang Factory,Shanghai,China



Changsha Factory,Hunan,China

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